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ABSTRACT

Divided into five parts, this document presents the projections of the Job Opportunities Forecast for the Washington State Labor Market through 1985. (A separate document, CE 018 690, discusses the methodology behind the forecasts.) Part 1, which serves as an introduction, describes the occupational information presented in the forecast and lists the forecast objectives. A summary of the material contained in the remainder of this report concludes the introduction. Part 2 includes the following information: a description of the Occupational Education Forecasting System; the background and evolution of this system; an overview of the methodology and data base; and limitations of the forecast's results. Part 3 presents the highlights of this report. There is a section which assists the reader in interpreting the detailed results presented in part 4; and a section comparing the current edition of the forecast with previous editions is also included. Part 3 concludes with a summary analysis of the detailed forecast. The detailed results found in Part 4 are presented in five categories: current vocational education programs; potential/emerging vocational education programs; professional education programs; forecast summary and references to other educational programs. Job opportunties, employment levels, and replacement rates are provided for each program. Appended are reports of the economic outlook used by the Washington State Department of Revenue and of occupational trends prepared by the Washington State Employment Security Department. (BM)

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Job Opportunities Forecast For Washington State 1974 to 1985

Washington State
Commission for Vocational Education

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SUMMARY OF FINDINGS

January 1978

U S DEPARTMENT OF HEALTH
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
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3rd Edition

CE 018 691

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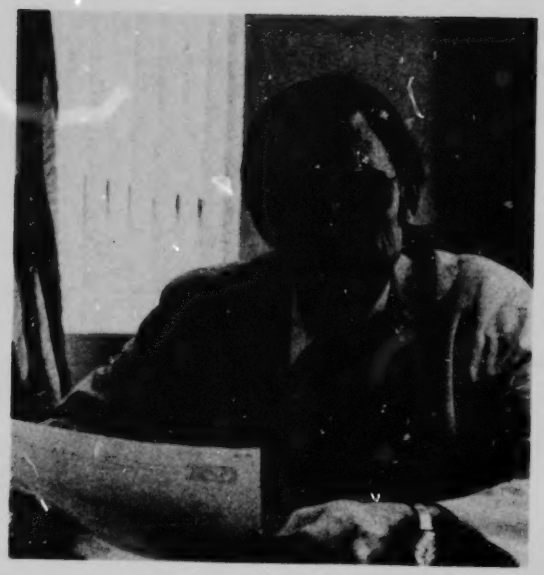
FOREWORD



Homer J. Halverson
Executive Director
Washington State
Commission for
Vocational Education

A third edition of the *Job Opportunities Forecast* has been prepared for your use in the development and planning of vocational education programs. New federal legislation, the Educational Amendments of 1976 (PL 94-402), has reemphasized the need for comprehensive planning of vocational education programs. Current occupational employment statistics are essential to this process. While the lack of occupational supply information continues to restrict program planning, occupational demand information has been refined to the point that it is a useful tool. To facilitate the collection and distribution of occupational information, the new legislation has created a National Occupational Information Coordination Committee. Corresponding State Occupational Inforamtion Coordinating Committees are now in the process of being formed. In Washington State the Commission for Vocational Education will participate as a voting member of the state committee and will be responsible for the receipt of federal funds supporting the effort.

The Washington State *Job Opportunities Forecast* presents occupational demand information in a form suitable for vocational education program planning. This forecast continues to be consistent with the mandates of federal and state legislation. The third edition incorporates systems modifications that improve the reliability of the forecast. Also, coverage has been expanded to include a limited number of professional occupations. This report should be received as a planning tool and used as a guideline for both state and local planning of vocational education programs.

ACKNOWLEDGEMENTS

The third edition of the Washington State *Job Opportunities Forecast* was developed by Human Resources Planning Institute, Inc. (HRPI) under contract to the Washington State Commission for Vocational Education (CVE), Homer Halverson, Executive Director. Wallace H. Thoemke supervised the project for CVE. The current forecasts were produced on a computer model, the Occupational Education Forecasting System, which has been under development by HRPI during the past four years. Marc Reeder, HRPI Director of Computer Systems, provided overall project direction for the consultant. Theodore Lane, President of HRPI, acted as special advisor to the project. Shannon Davis was responsible for the programming of the Occupational Education Forecasting System. Sharon Shuldt and Steve Ross provided additional computer programming support. Kay Landolt Gee assisted in editing the report.

The Interagency Forecast Task Force provided guidance and overall systems planning. Members of the Task Force contributed to the preparation of the system input. Raymond Harry, of the State Board for Community College Education and Task Force Chairman, coordinated the revision of the Crosswalk assignments. He was assisted in this effort by Peggy Anet and Neil Uhlman of the Council for Post Secondary Education, and the program development staff of the Office of the Superintendent of Public Instruction. Data for the Economic Forecast was taken from the *Long Term Employment Forecast*, prepared by David Weig, then of the Department of Revenue, now of the Office of Financial Management. The Industry-Occupation Matrix was made available by Brian Long of the Department of Employment Security. Robert Conner and David Bosse, also of Employment Security, coordinated the adaptation of the matrix and other labor force statistics for use in the Occupational Education Forecasting System. Other members of the Task Force that were directly involved with the project were: John Walker of the Office of Financial Management, Phillip Medgard of the Office of the Superintendent of Public Instruction, John Swannack of the Office of Community Development, Gilbert Zuerlein of the Commission for Vocational Education and staff members of the Washington Occupational Information Service.

Contributions from outside the Task Force came from the Bureau of Labor Statistics (BLS), who supported the project by furnishing labor force data, including the Industry-Occupation Matrix. Steve Teigland and Gary VanHorn of the Region X, Office of BLS acted as liaison between the national office of BLS and the Washington State Department of Employment Security. Also supporting the project was Demetrius Moutsanides of the Department of Labor, Employment Training Administration, Region X.

Funds for this project were provided by a special development grant from the U. S. Office of Education, Bureau of Occupational and Adult Education.

To all of the above, appreciation is expressed for their help in preparing the third edition of the *Job Opportunities Forecast*.

INTRODUCTION

Part I introduces the third edition of the *Job Opportunities Forecast* for Washington State. The occupational information presented in the forecast is described, and the objectives of the forecast are listed. A summary of the material contained in the remainder of the report concludes the introduction.

PART I

INTRODUCTION

The Washington State *Job Opportunities Forecast** is a projection of statewide employment demand for occupations related to educational programs. This third edition of the forecast continues the development of the Occupational Education Forecasting System which has been underway since 1973. A number of improvements and revisions make the current results more comprehensive and more reliable. The coverage of the forecast has been expanded to include a wider range of educational programs. A limited number of professional occupations are included for the first time. The forecast data base contains the most recent information available. Refinements in the forecast methodology make it more sensitive to changes in the occupational structure of the labor force. The report on the third edition is in two volumes. The *Summary of Findings* presents the forecast for a general audience of educational users, including administrators, planners, counselors, teachers, students and parents. A *Technical Report* is available for those who desire a more detailed presentation of the forecast data base and the methodology that underlies the results.

Coverage of the Forecast

The Job Opportunities Forecast has been designed for use in the educational community. Classification systems in the forecast differ between vocational and professional programs. For vocational educational programs the forecast uses a classification system of the U. S. Office of Education, (OE). The professions are classified by the Higher Education Information Survey (HEGIS) coding system. Occupational employment is presented for the various work skills possessed by graduates of each of 251 educational programs. The occupational data base available to the forecast system does not distinguish between levels of experience possessed by workers. Thus the job opportunities reported for a given educational program refer to positions in the labor force that graduates are qualified to fill--either immediately or upon acquiring additional work experience.

Several types of occupational employment information are presented for each program in the forecast, for three historic years and nine forecast years, from fiscal year (FY) 1974 through FY 1985. First, an employment level is given. This represents a count of jobs rather than workers and includes part-time as well as full-time positions. Jobs held in all sectors of the economy--private, government, self-employed, and a small number of unpaid family jobs--are counted in the employment level. Second, employment demand is specified. This represents a count of job opportunities, that is, positions in the labor force that will become available. Demand includes entry level positions as well as positions requiring more extensive work experience. Two major components of total demand are also presented in the forecast. These are expansion opportunities and replacement opportunities. Expansion opportunities account for positions created due to economic growth. Replacement opportunities account for positions made available when other workers separate from the labor force.

There are other types of occupational employment information that are not included in the forecast. At this time there is no accounting for positions created when workers change occupations. This important aspect of labor force

*The Washington State *Job Opportunities Forecast* is the title of the report. Job Opportunities Forecast, or JOF, refers to the forecast results presented in Part IV.

analysis is only now beginning to be explored. As appropriate data is collected, occupational mobility can be incorporated into future editions of this forecast. A second type of information, not included here, is labor force supply. This represents workers, living in thelocal labor market area, who are qualified to work in a given occupational field. In addition to workers currently employed, supply has many other components, some of which are especially difficult to forecast. These components include graduates from public and private educational programs, and graduates of employer training, apprenticeship, and military training programs. There is a pool of workers who possess skills in several fields and who would shift occupations given the opportunity. Also, unemployed workers must be considered. Finally, the most difficult to estimate, are workers who migrate into or out of the local labor market. While some of these components of supply can be quantified historically, and even projected into the future, for others there are no data currently available.

The available data base has been and continues to be the primary restriction in labor force forecasting. The improvements in the *Job Opportunities Forecast* over the past four years are directly tied to corresponding improvements in the occupational data base. As this trend continues, the forecast of employment demand can be refined further, and the forecast of occupational supply can be added to give the educational community a more complete picture of future labor force trends. For now, users of the third edition should keep in mind that, even with its limitations, the *Job Opportunities Forecast* represents a valuable tool that has filled a need for occupational employment information where no similar educationally-related forecast has existed.

Purpose of the Forecast

The objectives of this report are wider than simply presenting the results of the forecast. The primary objectives of the report are to:

1. Present a twelve year job forecast for occupations related to educational programs in Washington State.

2. Provide a comparison to the previous edition and to the forecast of Washington State Occupational Trends, published by the Washington State Employment Security Department.

3. Inform users of the background and evolution of the forecast system, its major features and limitations.

4. Support comprehensive educational planning requirements.

5. Identify the major participants involved in developing the forecast system.

6. Provide references to detailed technical documentation and other resource materials.

7. Obtain feedback on the content, value, use, and distribution of the *Job Opportunities Forecast*.

The *Job Opportunities Forecast* can be used by a variety of members in the educational community. Administrators and planners can use this report to assist in program planning. Counselors and teachers will find this publication useful for recommending new programs to administration and for helping students select programs with potential for job placement. Similarly, students and parents can use the report to help plan occupational choices.

Summary of Report Contents

Part II presents the Occupational Education Forecasting System, the computer model used to generate the forecasts. The background and evolution of this system are discussed, and the methodology and data base that the system uses are described in general terms. The limitations that the methodology and data base impose on the forecast results are presented to aid the user of the forecast in applying the results.

Part III presents the highlights of the third edition forecast. First, there is a section which assists the reader in interpreting the detailed results presented in Part IV. Here, the key terms used in the forecast tables are carefully defined within the context of the modeling procedure. Second, there is a section comparing the current edition of the forecast with the edition previously published. Both revisions to the data base and the modeling methodology are discussed. The relative change in the Job Opportunities Forecast between the two editions is examined at the vocational field level. Part III concludes with a summary analysis of the detailed forecast presented in Part IV.

Part IV presents the detailed results of the forecast. Total job opportunities (demand) created by economic growth (expansion) and by labor force separations (replacement) are given for occupational skills taught in 251 educational programs in Washington State. The forecast is broken into five sections.

1. Vocational Education Programs (currently offered)
2. Potential/Emerging Vocational Education Programs
3. Professional Education Programs (a limited selection)
4. Forecast Summary (includes other occupations)
5. References to Other Educational Programs

In addition to job opportunities, employment levels and replacement rates are provided for each program. The forecast covers a period of twelve fiscal years, from 1974 to 1985. The first three years of this period use actual labor force reports within the occupational modeling procedure. The last nine years are based upon the *Long Term Employment Forecast* of the Washington State labor market.

The Appendix provides additional information helpful in understanding the Job Opportunities Forecast. The economic outlook used by the Washington State Department of Revenue to develop the *Long Term Employment Forecast* is presented. Also in the Appendix is a report of occupational trends prepared by the Washington State Employment Security Department (ES). This report,

included in its entirety, is based upon an economic outlook slightly less optimistic than that used for the Job Opportunities Forecast. The ES report uses the occupational categories of the U. S. Census as adapted by the Bureau of Labor Statistics. Therefore, comparison with the JOF can be misleading without first consulting the correspondences between the Census and the educational programs presented in the *Technical Report*. However, the ES report is carefully prepared and thoroughly analyzed, making it a valuable supplement that should be consulted by users of the *Job Opportunities Forecast*. The Appendix concludes with a glossary of terms used in the main body of the report and a bibliography.

OCCUPATIONAL EDUCATION FORECASTING SYSTEM

The Occupational Education Forecasting System is a computer model that relates employment demand for occupational skills to educational programs. This system was used to produce the Job Opportunities Forecast. Part II of the report discusses the background and evolution of this system. There is also a general description of the model, the data base it uses, and the computer programs that carry out the computations leading to the forecast results. Part II closes with a discussion of the limitations on the forecast imposed by the system's data base and methodology.

PART II

1. BACKGROUND AND EVOLUTION

In the late 1960's and early 1970's, a new approach to vocational education program planning was taken as a result of the Vocational Education Act, Public Law 90-576. More recently, planning requirements have been redefined by the Educational Amendments Act of 1976, Public Law 94-482. Both of these pieces of legislation emphasized the need for federal, state and local officials and advisory councils to use current and projected occupational employment information in evaluating, planning and allocating resources for educational programs. The Educational Amendments created a National Occupational Information Coordinating Committee (NOICC). Corresponding State Occupational Information Committees (SOICC) are now in the process of being formed.

In Washington State the role of the SOICC is still being defined at the time of this writing. However, there is a committee, which over the last four years has been serving many of the functions that are now being required by federal legislation. This committee, known as the Interagency Forecast Task Force, is made up of representatives of key state agencies responsible for occupational education and manpower training. The Task Force directs the development and operation of the Occupational Education Forecasting System and the Job Opportunities Forecast that the system produces. The agencies participating on the Task Force are:

- The Office of Financial Management (OFM),
- The Employment Security Department (ES),
- The Commission for Vocational Education (CVE),
- The State Board for Community College Education (SBCCE),
- The Office of the Superintendent of Public Instruction (SPI),
- The Council for Post Secondary Education (CPE),
- The Department of Revenue (DR),
- The Office of Community Development (OCD),
- The Department of Commerce and Economic Development (CED), and
- The Washington Occupational Information Service (WOIS).

The Task Force came into being four years ago as an advisory committee to the Commission for Vocational Education (CVE). At that time the function of the committee was only to review the vocational education forecasts prepared by CVE and make suggestions for improvements. The advice of a multi-agency group proved extremely useful and led to the development of the present Occupational Education Forecasting System. The membership of the advisory committee was expanded and reconstituted as the present Task Force. Both data using and data supplying agencies are now represented. The function of the Task Force has likewise been expanded, from the earlier role of giving advice and technical assistance to a role of administration of the educationally related Job Opportunities Forecast.

The Task Force members quickly realized that the existing occupational employment information was not suitable for precisely identifying the employment opportunities available to graduates of the state's educational programs. They contracted with Human Resources Planning Institute (HRPI) for help in developing an occupational information system more suitable to educational

planning. HRPI provided analytical methods and a knowledge of the labor market. The Task Force provided a knowledge of the workings of state government and of educational planning. Emerging from this special mixture of skills and backgrounds was the Job Opportunities Forecast.

There were two basic reasons why the Task Force decided to create the JOF when occupational projections were already available from Employment Security. First, the classification system used by ES was not always compatible with the classification system of the state's educational programs. To attack this problem the JOF used an index of correspondences between the categories of the two classification systems. This index came to be known as the Crosswalk. Second, the Task Force wanted the JOF to be based upon the *Long Term Employment Forecast*, produced by the Department of Revenue.* This report is the official planning forecast for budget and fiscal matters in the State of Washington. Also it contains information not used in other occupational employment projections in the state.

The Occupational Education Forecasting System was used to produce the first edition of the *Job Opportunities Forecast* in 1973. Since that time, the forecasting system has been in a state of evolution and improvement. Refinements in the forecast methodology over the past four years have made the results of each subsequent edition more sensitive to actual labor market conditions. To a large extent, this evolution has been brought about by corresponding improvements in the data base the system uses. In its most general sense, the term data base refers here to all of the information supplied to the forecast system. This includes the Industry-Occupation Matrix, the Economic Forecast, and the Crosswalk assignment index.

Availability of an Occupational Data Base

The Job Opportunities Forecast uses an occupational employment data base that depicts the mix of skills employed within various industry sectors of the labor force. This data base has undergone a rapid evolution during the past four years.

When the first edition of the *Job Opportunities Forecast* was undertaken in 1973, the best occupational information available was from a household survey conducted by the Department of Commerce as part of the 1970 Census of the Population. Manpower Tallies for each state and for selected metropolitan areas within each state were tabulated from information extrapolated from the household survey. These tallies present employment for 440 occupations in 227 industries for a given region. Employment levels were further broken down by 12 worker classes. For example, all welders employed in the construction industry were classified by the sector of their employment--the private sector, the government sector, the self-employed sector, etc., as well as by their sex. This matrix was the most detailed occupational data base available at the time; it contained 1.2 million separate data entries. The first two editions of the *Job Opportunities Forecast* were based upon the information it contained.

*The responsibility for this forecast has recently been assigned to the Office of Fiscal Management.

However, the Census Manpower Tallies have some rather severe limitations. First, although the Manpower Tallies were by far the most detailed data base available at that time, they were not detailed enough to give educational planners all the answers they required. Second, the occupational classification system of the census was often based on particular skills. Hence, the multiple skills possessed by graduates of educational programs could not always be accounted for under the census classification system. The JOF, created primarily to overcome this limitation, uses a sophisticated set of correspondences between census occupations and educational programs as a response to this classification problem. A third limitation of the Manpower Tallies was that the census information was constructed by surveying 20 percent of the nation's households. The resulting data included the natural bias of workers to upgrade their skills when classifying themselves. Thus, many engineering technicians were counted as engineers, and many typists were counted as secretaries. Finally, the Manpower Tallies were collected only once each decade. For the first two editions of the *Job Opportunities Forecast,* the data was available for only one point in time, a "snapshot" of the labor force as it was in April 1970. As such, it failed to capture the dynamic factors that a rapidly developing technology contributes to the labor market.

Significant improvements in the occupational employment data base have been made by the Department of Labor. This has been done through a cooperative effort between the national office of the Bureau of Labor Statistics and their representatives at the state level, the Department of Employment Security. Nationally, the improvements have come in two steps. First, the Industry-Occupation Matrix System was developed. More recently, the Occupational Employment Statistics (OES) Survey has been compiled for most states. However, in Washington State the OES Survey is not yet available.

The Industry-Occupation Matrix System, though still based upon the 1970 Census survey, has gone a long way to overcome some of the major limitations of the census data base. It provides employment matrices for three points in time to meet state and local area occupational information needs. Recent employment information has been combined with the original census data for two base years (presently 1970 and 1974). There is also a projected matrix produced for a target year, presently 1985. Thus the matrix system is a significant improvement on the original census data. It is this data base that was used for the third edition of the JOF.

The Occupational Employment Statistics (OES) Survey is a major breakthrough in improving the occupational data base. There is also an OES Program which encompasses both the survey and the Industry-Occupation Matrix System just described. Although the OES Survey is not yet available in Washington State, it warrants mention here. The OES Survey is conducted annually in participating states for one-third of the industry sectors--manufacturing one year, non-manufacturing (except trade) the second year, and trade the third year. Thus, the information for any given industry is updated every three years. Moreover, the matrix derived from the survey is much more finely disaggregated than either the census or the Industry-Occupation Matrix. Depending on the state, there are between 2,000 and 2,500 occupational categories and about 400 industry categories. Finally, some of the classification problems inherent in the census data are overcome. The categories are classified along the lines of the *Dictionary of*

Occupational Titles (DOT), which, unlike the census, provides definitions for each occupation. Also, the survey is conducted with employers rather than employees. The OES Survey is presently being conducted in 43 of the 50 states. In the states that participate in the program, the survey data are presently replacing the census data in the Industry-Occupation Matrix. Although Washington State is not as yet among the participants, it is hoped that such a survey will be started here in the future.

It is this Industry-Occupation Matrix, whether it is derived from the census survey or the more recent OES Survey, that is at the heart of a system projecting demand for occupational employment. BLS and Employment Security use it for their projections, and they have made the matrix for Washington State available for use in the educationally related JOF. Until the OES survey is undertaken in Washington State, the Industry-Occupation Matrix used for the JOF will be based upon the original census data. Even with its limitations, this Industry-Occupation Matrix represents the best occupational data base available for the state.

Other Components of the Forecast Data Base

Two other major components of the forecast data base are the Crosswalk and the Economic Forecast. These will now be discussed.

The Crosswalk is an index describing correspondences between the classification system of the Industry-Occupation Matrix and the coding system of the U. S. Office of Education (OE). The Crosswalk has evolved over the past several years. At first the correspondences were limited to simple aggregations of several occupational categories into a single vocational program. An example of this type of correspondence is where two matrix occupations, Real Estate Agents and Real Estate Appraisers, are both assigned to the program, Real Estate Sales. Later, some assignments were restricted to specific industry sectors. For example, all agricultural and biological technicians working in food processing industries were assigned to the program, Food Processing Technician. More recently, assignments have been added that share a matrix occupation with several programs. For example, the matrix occupation, Billing Clerks, is assigned partially to the program, Accounting, and partially to Secretarial Science. This is done in specified proportions. The present Crosswalk uses all of these various types of assignments to specifically relate each data entry in the Industry-Occupation Matrix to one or more programs.

In the JOF Crosswalk, a primary consideration was given to tracing employment opportunities rather than just matching skills. This feature distinguishes the Washington State Crosswalk from most cross-reference systems used in other states. A key to this process is a placement survey conducted each year by the community college system. A desirable consequence of this approach is that the forecast results in capturing <u>all</u> the job opportunities available to the graduate of a program, not just those with the most appropriate occupational title. For example, we know that graduates of a stenographer program enter the labor market not only as stenographers, but also as typists and secretaries.

The JOF Crosswalk accounts for this occurrence. It should be kept in mind, however, that educational programs are not the sole supplyer of workers filling the job demand presented in this forecast.

A final component of the forecast data base is the Economic Forecast. This forecast is a projection of year-by-year employment in key industry sectors. The levels of industry employment specified in the Economic Forecast are directly tied to the levels of occupational employment in the Job Opportunities Forecast. The overall state employment is the same for both. The Long Term Employment Forecast, prepared by the Department of Revenue, has been the official planning forecast for budget and fiscal matters in Washington State. The national and state economic outlook which led to the Economic Forecast is given in the appendix of this report.

2. GENERAL DESCRIPTION

The Occupational Education Forecasting System is a computer model of employment demand for occupational skills related to educational programs. The forecast system is sometimes referred to as the Job Opportunities Forecast, which it produces. However, the system is more than just the forecast results presented in Part IV of this report. It includes a data base, a mathematical model, and a system of computer programs. The methodological aspects of the forecasting system are presented in detail in the *Technical Report*, a companion document to this report. The intention here is to introduce the elements of the forecasting system and to show how they combine to produce forecasts of job opportunities.

Sources of the Forecast Data Base

The forecast data base consists of all of the input needed by the computational procedures of the model. The principal components of the data base are the Industry-Occupation Matrix, the Crosswalk assignment index and the Economic Forecast. In addition, a set of replacement rates gives labor force separations for various occupational categories. Also there is a list of names of the educational programs reported in the forecast results. All of these are discussed in detail in the *Technical Report*, and the principal components have been briefly introduced in the preceding section. Therefore, the data base will not be discussed in detail here. It might be useful, however, to give the sources for the various elements of the data base.

The Industry-Occupation Matrix is prepared by the Bureau of Labor Statistics from employment data reported in the 1970 Census. The 1974 base year matrix and the 1985 target year matrix are developed from the census data in combination with more recent labor force reports and projections. The Washington State Employment Security Department was responsible for acquiring the matrix data to support the Job Opportunities Forecast. The Crosswalk assignment index and the vocational education program titles were prepared by the State Board of Community College Education. The Economic Forecast was prepared by the Washington State Department of Revenue in cooperation with the Department of Commerce and Economic Development, the Department of Employment Security and the Office of Financial Management. The replacement, or labor force separation, rates were prepared by the Bureau of Labor Statistics.

Forecast Methodology

The approach used in the Occupational Education Forecasting System follows the guidelines developed by the Bureau of Labor Statistics in their *Tomorrow's Manpower Needs* methodology. This methodology separates the demand for occupational employment into two components: expansion and replacement. Expansion opportunities represent new jobs created by economic growth. Replacement opportunities represent job openings created by persons leaving the labor force. These two components are specified by occupational category for each year of the forecast and are a mathematical function of the employment level given for each category.

The JOF relates the industry employment levels given in the Economic Forecast to occupational employment levels. This is done by using a set of staffing ratios. These ratios represent proportions of industry employment in various sectors of the economy that apply to each of the occupations (educational programs) of the forecast. For example, the staffing ratios for the aerospace industry relate the proportion of total employees that are welders, engineers, secretaries, or work in other occupational classifications. Similar sets of ratios are determined for agricultural production, food and kindred products, pulp and paper, and all the other industry categories of the Economic Forecast. These ratios are determined for two points in time, a base year and a target year, and interpolated linearly for each intervening year.

To determine the staffing ratios, two things are needed. First, a detailed matrix gives industry and occupation employment for both a base year and a target year. Second, a Crosswalk assignment index provides correspondences between the various educational programs and the industry and occupational categories of the matrix. Both of these elements of the data base have been introduced in the previous section on background and evolution. Within the model the Crosswalk directs the assignment of each element of the Industry-Occupation Matrix into a new and smaller matrix, giving employment by educational programs (occupations) and by economic categories (industries). Because the new matrix is much smaller than the original, the assignment process is often referred to as the "squeeze". It is from the squeezed matrix that the staffing ratios are computed.

Computer Programs

The detail of the forecast data base and the numerous calculations required by the forecast methodology make the production of the Job Opportunities Forecast an ideal application for computer analysis. A system of computer programs produce various intermediate worksheets and tables displaying the forecast results. In the several stages of the forecast production, the output from one stage becomes the input for the next. This offers the forecast analyst an opportunity to review the intermediate results at each stage of production. In this way, many problems can be corrected at an early stage, thus reducing the overall cost of the forecast.

There are three major programs. The first accepts the Crosswalk index and creates cross-reference maps of the various assignments. The second uses the information in the cross-reference map to squeeze the Industry-Occupation Matrix into a form compatible with both the educational programs and the industry classifications of the Economic Forecast. The staffing ratios are computed at this point and displayed in a table. The third program uses the staffing ratios to allocate employment from the Economic Forecast to each educational program. Also, replacement and expansion opportunities are determined and combined into total job opportunities applicable to each educational program.

The programs are installed on the Control Data Corporation (CDC) 6400 Computer at the University of Washington and written in the FORTRAN IV computer language, (CDC FORTRAN EXTENDED). This system of programs, the data base it requires for input, and the output tables it produces are discussed in Section 5 of the *Technical Report*. Mathematical formulations are presented.

3. LIMITATIONS

In developing a forecast system of any complexity, numerous assumptions and design decision must be made. The mathematical model which generates the forecast is, by definition, an approximation of a real economic system. Similarly, other assumptions and restrictions have been imposed by the data base used by the model. Together these restrictions impose limitations on the forecast results, both in the accuracy of the values presented and in the context in which they may be used. This section discusses these limitations.

Mathematical Uncertainties of the Forecast

The accuracy of the forecast results is especially difficult to assess. There are uncertainties associated with the various components of the data base. As this input is combined in various mathematical ways within the model, additional uncertainties result. In theory, if the input uncertainties are known, it is possible to quantify the output uncertainties. One might say, for example, that the forecast of job opportunities in a given educational field in a given year is known to be within a certain range surrounding a most probable value. The range is expressed as an upper and lower bound on the forecast value, for example ± 20 percent. Unfortunately, this is not possible in the case of the Occupational Education Forecasting System. In many cases, data values have been generated by other modeling procedures which have their own set of assumptions. The uncertainties associated with these assumptions are unknown.

Definitional Limitations

Many of the limitations in the forecast model can be explained by defining the terms used in this report. These definitions restrict the context of the forecast results to match corresponding assumptions in the model and restrictions in the data base. A fairly extensive presentation of key terms used in the forecast is given in Part III, Section 1 - Interpreting the Forecast Results. This material will not be repeated here. However, that discussion represents an important aspect of the limitations of the forecast system.

The results of the Job Opportunities Forecast have some limitations in their application to educational program planning. First, the projections of employment demand represent total job opportunities. They are not restricted to just entry level positions. Also, they represent a count of jobs rather than a count of workers. Thus full-time, part-time and "moonlighting" jobs are counted in the total. The supply of workers filling these job opportunities is more than just the output of educational programs. This is discussed in the introduction on page 4. However, total job openings represent an upper bound on the positions available to graduates of educational programs.

A second limitation on the results concerns estimates of job openings due to replacement needs. This component of the total demand is computed from labor force separation, or replacement rates, supplied by BLS. These rates

reflect workers separating from the labor force, not replacement due to occupational mobility. Thus, workers changing occupations but remaining in the labor force do not create replacement job openings. The effects of occupational mobility are relatively unexplored and have not been accounted for in this model. Sommers and Eck report in their recent article, *Occupational Mobility and the American Labor Force**, that between 1965 and 1970, changing occupations was twice as common as leaving the labor force. It should be kept in mind, however, that workers shift both into and out of a given occupation. Therefore, even though the total changes of occupations may be quite significant, the net change to any given occupation may well be small.

The methodology used by the model has been refined and improved with each successive edition of the *Job Opportunities Forecast*. The most recent modifications added the capability of projecting staffing ratios and replacement rates over a twelve year period to better reflect the shifts in the occupational structure of the real labor force. Also, the capability of using a highly disaggregated set of economic categories was added. However, this capability was not exercised in the current forecast. Most of the remaining limitations of the model are external, imposed by the characteristics of the data base.

Limitations of the Data Base

The model is designed around the BLS Industry-Occupation Matrix, which in turn is based upon the Manpower Tallies of the 1970 Census. This is not the place to review the census's methodology, but it should be pointed out that the Manpower Tallies of industry-occupation employment are based on a sample and therefore can be expected to contain small random errors. Also, the classification of each respondent to the census survey into a particular industry-occupation cell is not perfectly certain. Not only is the judgment of the census tabulator involved, but the industry designation of a particular firm may change abruptly. There is a natural tendency of respondents to upgrade themselves when specifying their occupational category. Thus, people who work as typists may classify themselves as secretaries. Similarly, individuals may possess more than one skill: they may work mostly in occupation A, but also in occupation B. The census only records the principal occupation of each person and the industry category into which most of a firm's products fall. These discrepancies in the classification system become apparent when reviewing the tabulation of the census occupations. Some categories report no workers; an example of this is political scientists. This is because people in this category were classified elsewhere in the 1970 Census tabulation.

The consequence of all of this is that in a few cases the employment reported by the census differs significantly from other available surveys and labor employment reports. These problem areas should be identified and tagged for additional review. Perhaps, as a future modification, staffing ratios can be generated from sources other than the census and entered into the model to update the problem census data. In any case, even those census limitations are sometimes perplexing, it should be kept in mind that they represent only a tiny minority of the huge body of data that the census provides. Some of these limitations have been corrected in the BLS adaptation of the census data.

Monthly Labor Review, U. S. Department of Labor, January, 1977, p. 3.

Another type of limitation centers on the Crosswalk. It is up to the forecast analyst to generate a set of correspondences between the industry and occupational categories of the matrix and the set of educational programs. The degree to which the forecast captures actual employment appropriate to the educational programs is determined by the amount of skill that is brought to bear on the generation of the assignment codes. It should be kept in mind that no matter how sophisticated the internal algorithms of the system are, if the assignment codes are not appropriate, then the forecast will be unsatisfactory. Because of the importance of this issue, a great deal of care was taken in the development of the JOF Crosswalk.

Conclusions

While the forecast has limitations, it remains a useful tool and provides valuable guidelines in areas where none existed before. Forecasting by mathematical model is an immense improvement over forecasting by intuition, since the results are based upon a well thought-out set of assumed conditions that are imposed in a systematic way. Thus, even though the results cannot and should not be interpreted as exact prophecies of the future, they do capture significant trends in the occupational structure of the labor market.

HIGHLIGHTS OF THE FORECAST

Part III presents the highlights of the third edition. In the first section of Part III, the key terms used in the forecast tables are defined within the context of the modeling procedure. These definitions will assist the reader in interpreting the detailed results presented in Part IV. Second, a section compares the current edition of the forecast with the edition previously published. Revisions to the data base and to the modeling methodology are discussed. The relative change in the Job Opportunities Forecast between the two editions is examined at the vocational field level. Part III concludes with a summary analysis highlighting various aspects of the detailed forecast presented in Part IV.

PART III

1. INTERPRETING THE FORECAST RESULTS

The forecast was derived from a complex modeling procedure. Interpretation outside the bounds of the constraints of the model can be misleading. Therefore, it is recommended that all users of these forecasts review this section before consulting the forecast tables.

Values presented in the forecast tables are labeled with terms such as demand, replacement, expansion, and employment. Although the user of the forecast is familiar with the everyday meanings of these terms, within the forecast they have restricted meanings. Below is a short discussion of each of the key terms.

Educational Programs, or rather the employment skills associated with them, form the basis of occupational classification within this forecast. For convenience, programs and occupations sometimes become synonymous. However, when the term program is used in this way, it is program skills that are implied. Programs do not employ people, but rather contribute workers with specific occupational skills to a supply pool. The job opportunities reported in this forecast are filled from this supply pool, of which educational programs are one source.

Supply represents workers, living in the local labor market area, who are qualified to work in a given occupational field. In addition to workers currently employed, supply has other components. These components include graduates from public and private educational programs, and graduates of employer training, apprenticeship, and military training programs. In addition there is a pool of workers who possess skills in several fields and who would shift occupations given the opportunity. Also, unemployed workers must be considered. Finally, the most difficult to estimate, are workers who migrate into or out of the local labor market.

Vocational and Professional programs are represented in the Job Opportunities Forecast. In the past, the JOF has been exclusively concerned with vocational education programs. The third edition now includes a short section of professional education programs. There is sometimes an overlap in jobs applicable to vocational and professional education skills. The first attempt to capture professional job opportunities in this forecast, avoids this problem by considering only those occupations not previously assigned to vocational education. As such, the professional programs presented in Section 3 of the forecast represent only a portion of all professional education programs, currently (or potentially) offered in the state.

Demand represents available job opportunities classified by skills related to specific educational programs. Total job openings, not just entry-level positions, are included. However, educational programs supply only a portion of this total demand. Thus, the demand level presented in the forecast constitutes a high bound of positions available

to program graduates. The mix of skills applicable to a given program is controlled by the Crosswalk. Demand is calculated as the sum of expansion and replacement.

Replacement represents job opportunities created by persons leaving the labor force for reasons such as quitting, being fired, retirement, out-migration, etc. Job openings created when workers change occupations while remaining in the labor force are not included. Replacement for a specific program is computed by multiplying a replacement rate and a level of employment.

Expansion represents job opportunities created by economic growth. Expansion is computed for an educational program as the difference between the employment forecast in a given year and the forecast for the previous year. As such, a negative value for expansion represents a decline in the employment level.

Employment is a count of jobs in the labor force classified by skills related to specific educational programs. Employment, unlike demand, includes all job positions. Demand includes only job positions available to be filled. Employment is allocated from the jobs reflected by the Economic Forecast to each educational program according to the instructions in the Crosswalk. Graduates of educational programs may find employment in a range of related occupations. This feature is captured in the forecast through the design of the Crosswalk. For example, the employment levels given for the stenographer program include not only stenographer positions, but secretarial and typist positions as well. All jobs are counted, including those of full-time, part-time, and dual job holders. The employment count combines jobs held by all types of workers, including the self-employed, government workers, and unpaid family workers.

Replacement Rates are proportions of jobs (employment count) in a given occupation that become available each year because other workers have separated from the labor force. The rates presented in the forecast for each educational program have been computed from data provided by the Bureau of Labor Statistics for the occupational categories of the Industry Occupation Matrix. The computation is based on an employment weighted averaging procedure for the years 1974 and 1980. Values are interpolated for the intervening years. Lacking any basis to project replacement rates after 1980, values for 1980 through 1985 remain constant. The replacement rates used for the third edition have been recently revised to reflect the changing participation of women in the labor force. As a consequence, the rates are somewhat lower than those reported in the second edition. This change in replacement rates varies by occupation, the most profound shifts coming in occupations traditionally dominated by women. Since replacement typically represents from 50 to 75 percent of total job opportunities, the rate revisions have a major impact on projected demand.

OE-Codes reflect the classification system of the U. S. Office of Education for educational programs in the nation. The codes used in the Job Opportunities Forecast have been adapted for Washington State and therefore differ slightly from the national codes in some cases. (See Part IV, Section 5 for references to codes not included in the forecast.) The professional occupations given in Part IV, Section 3, use the codes of the Higher Education General Information Survey (HEGIS), preceded by a "99".

Fiscal Years 1974 through 1985 form the twelve time divisions of the forecast. A fiscal year (FY) runs from July 1st through the following June 31st. For example, FY 1978 began on July 1, 1977. The first three years of the forecast have now passed. However, no basis exists to measure occupational employment directly for FY 1974-77. The same modeling procedures used for estimating occupational employment for future years were therefore applied to this historic period. One difference exists in the results presented. Those for the historic period (FY 1974-77) are based upon actual labor reports (of employment by industry). Those for the future period (FY 1978-85) are based on the Economic Forecast.

The Crosswalk is a correspondence index relating the classification system of the Industry-Occupation Matrix (which depicts the occupational mix of the labor force) to the coding system of the Office of Education. The employment level presented for each educational program is dictated by the Crosswalk assignments. The Crosswalk was designed to trace employment opportunities as well as to match skills. For example, we know that graduates of the stenographer program are likely to enter the labor market as typists and secretaries. The Crosswalk attempts to deal with this fact. The *Technical Report*, provided as a separate volume, lists the Crosswalk index used for the third edition and describes the methods employed in its design.

The Economic Forecast projects the size of the labor force for several future years. Through the Economic Forecast, assumptions concerning the national and state economic outlook enter the Job Opportunities Forecast. The Economic Forecast is broken into about 30 industry sectors. Using these levels of industry employment, the JOF model then determines the corresponding levels of occupational employment. Data for the Economic Forecast are taken from the *Long Term Employment Forecast*, developed by the Washington State Department of Revenue for the calendar years 1977-85. Actual labor force reports are used for the calendar years 1973-76. The Economic Forecast and historic labor reports are adapted for use in the JOF. The adaptation includes conversion from calendar to fiscal years. The methods of adaptation are discussed at the end of Appendix B in the *Technical Report*.

The *Industry-Occupation Matrix* determines the mix of occupational employment in the labor force. This detailed data base, prepared by the Bureau of Labor Statistics, is available for two base years, 1970 and 1974, and a target year, 1985. The model uses this data base to account for shifts in the occupational staffing patterns of the labor force. The Crosswalk converts the classification system of this matrix to the classification system for educational programs.

2. COMPARISON OF SECOND AND THIRD EDITIONS

The third edition of the *Job Opportunities Forecast* incorporates a number of improvements and revisions that make the results more comprehensive and reliable. The changes are in three major areas. First, the coverage of the forecast has been expanded to include a wider range of educational programs. Second, the forecast data base has been revised to include the most recent information available. Third, the forecast methodology has been refined to be more sensitive to changes in the occupational structure of the labor force.

Expanded Coverage

New educational programs have been added to the forecast. These include 14 vocational education programs and 43 professional education programs. Many of the new vocational education programs were previously identified as potential or emerging programs in the second edition. Professional education programs were not included in the second edition. Section 3 of the third edition presents a limited number of professional programs. The table below gives a breakdown of programs by section comparing the second and third editions. Vocational Education Programs are further broken down by field. Percent of demand given in the table represents the proportion of total job opportunities appropriate to each section and field of the forecast. The percent demand given for professional education programs represents only that portion of all professional job opportunities applicable to the limited number of programs presented in Section 3.

COMPARISON OF SECOND AND THIRD EDITIONS

	Programs (Second)	Programs (Third)	% Demand (Second)	% Demand (Third)
Section 1 - Vocational Education	168	182	82.7	84.6
01 Agriculture	11	11	5.4	7.0
04 Distributive Education	18	22	19.0	20.0
07 Health	28	29	8.4	6.4
09 Home and Family Life	5	5	2.2	1.6
14 Business and Office	23	23	22.0	19.9
16 Technical	25	30	3.8	5.3
17 Trade and Industrial	58	62	22.0	24.4
Section 2 - Potential/Emerging Vocational Education	33	26	3.3	2.6
Section 3 - Professional Education	0	43	0	5.7
Other Occupations	-	-	14.0	7.1
Total, All Sections	201	251	100.0	100.0

Improved Data Base

Revisions to the forecast data base were made wherever more recent information was available. These revisions affected all components of the data base: the Crosswalk, the Industry Occupation Matrix, the Economic Forecast, and the rates reflecting labor force separations, (replacement rates).

The Crosswalk assignment index, (which specifies the correspondences between the categories of the Industry-Occupation Matrix and the educational programs of the forecast), was revised and updated. This was necessary to account for the new programs added to the forecast, but the Crosswalk assignments for many of the old programs were revised as well. Each program assignment used for the second edition was reviewed. Where necessary, assignment changes were made. The review process was a joint effort by the members of the Interagency Forecast Task Force. The refinements to the Crosswalk assignments created corresponding changes in the third edition forecast results.

The updated Industry-Occupation Matrix, used for the present model, was provided by the Bureau of Labor Statistics. This BLS matrix, while still based on census data, overcomes some of the limitations of the Manpower Tallies, used by the second edition. The Industry Occupation Matrix, from which occupational staffing patterns were determined for the present model, includes both a base year (1974) and a target year (1985). The second edition, using the Manpower Tallies, was limited to information based on a single point in time for its occupational staffing ratios. Staffing patterns in the third edition, projected into the future to reflect changes in the structure of a dynamic labor force represent a significant improvement in the model.

Another revision to the data base concerns the Economic Forecast. A new Long-Term Employment Forecast was prepared by the Department of Revenue to be used for this edition. The forecast includes the period 1977 through 1985. It contains specific assumptions for both national and state economic outlooks. In addition, it is based upon population projections prepared by the Office of Financial Management. Historic employment data for FY 1974 through FY 1976 are included in the new Economic Forecast. With this data the coverage of the Job Opportunities Forecast spans the 12 year period, 1974-1985 covered by the Industry Occupation Matrix.

Various forces in the economy are expected to produce strong employment growth through the end of this decade and a fairly rapid slowdown during the first half of the 1980's. The new Economic Forecast shows stronger employment growth than the one used for the second edition. This stronger growth is consistent for the period FY 1977-82. Thus, the overall demand for jobs in this period is shown as higher in the third edition than in the second. After FY 1982, (a period not projected by the second edition) the more recent forecast shows a downturn in the annual growth rate of employment.

The new Economic Forecast uses actual labor force reports for the period before FY 1977. The employment level tends to be lower for the 1976 recession than the level projected in the previous Economic Forecast. Thus, the demand for jobs reported in the third edition dips sharply in FY 1976. In some educational programs the 1976 demand is negative. The negative value indicates

a decline in the number of jobs available, other than those due to normal replacement needs for that year.

The present JOF uses revised replacement rates. Replacement rates capture job turnover due to labor force separations. The rates used in the third edition were computed from data provided by the Bureau of Labor Statistics (BLS). BLS has recently revised their replacement data to reflect the increased participation of women in the labor force. As a consequence, replacement rates for women are reduced in many occupations. Within the JOF, rates for women and men are combined. Therefore, only occupations where women represent a large proportion of the employment show profound changes. These revisions have had an effect on the replacement job opportunities reported in the third edition.

A direct comparison between editions of replacement rates by educational program is difficult. This is because changes in the replacement rates have come at the occupational category level. The Crosswalk, which relates occupational categories to educational programs, has itself undergone revision between the two editions. Therefore, a comparison of replacement rates will be made by BLS occupational categories.

The table below shows the 20 occupational categories that underwent the largest changes in the BLS revision. Both the old and the revised rates are given for 1972. To the right of each category are the OE-programs to which that occupation is assigned in the third edition. Only occupational categories applicable to current educational programs are listed. Of the 377 occupational categories, 204 declined, 26 dropped by over 50 percent, 100 dropped by 20-50 percent and 78 dropped by less than 20 percent. The remaining 173 occupations increased, most by amounts less than 10 percent. The rates presented below include both male and female workers.

REPLACEMENT RATE REVISIONS -- THE TWENTY GREATEST CHANGES

	Occupation	New Rate	Old Rate	Percent Change	OE-Programs Applicable to JOF
1.	Ushers, Recreation, Amusement	.0204	.0617	-66.9	14.18.00, 14.20.00
2.	Dancers	.0347	.1036	-66.5	99.10.08
3.	Flight Attendants	.0316	.0916	-65.5	04.19.98
4.	Health Trainees	.0320	.0913	-65.0	17.04.99, 17.09.07, 17.99.01
5.	Actors	.0200	.0565	-64.6	99.10.07
6.	Home Management Advisors	.0215	.0564	-61.9	04.10.00, 16.05.98, 17.11.00
7.	Keypunch Operators	.0267	.0683	-60.9	14.02.02
8.	Dental Assistants	.0303	.0749	-59.6	17.01.01
9.	Clerical Assist, Soc Welfare	.0246	.0602	-59.2	14.07.00
10.	Bank Tellers	.0266	.0635	-58.1	14.04.00, 14.01.05
11.	Waiters	.0281	.0641	-56.2	17.29.02, 17.29.04
12	Typists	.0311	.0696	-55.3	14.07.95, 14.07.96, 14.09.00
13.	Bookkeeping, Billing Operator	.0285	.0624	-54.3	14.01.01
14.	Food Counter, Fountain Worker	.0275	.0601	-54.2	17.29.02, 17.29.04
15.	File Clerks	.0329	.0717	-54.1	14.04.97, 14.07.00, 14.07.95, 14.07.96
16.	Teachers Aides, Exc Monitors	.0195	.0414	-52.9	09.02.01, 09.02.96, 09.02.98, 09.02.99, 16.06.99
17.	Receptionists	.0327	.0693	-52.8	04.20.00, 14.04.97, 14.07.00, 07.01.00, 07.09.04
18.	Duplicating Machine Operators	.0267	.0564	-52.7	14.03.01, 14.07.00
19.	Secretaries, Legal	.0303	.0638	-52.5	14.07.98
20.	Solderers	.0176	0367	-52.0	17.03.98, 17.23.06

The effect of replacement rate revisions on replacement job opportunities is not always clear. Although many replacement rates in the third edition are down substantially from those used in the second, employment levels are generally up. Since replacement opportunities are determined by multiplying an employment level and a replacement rate, the net effect varies. Also, the third edition uses rates that vary year by year while the second edition used static rates.

However, at the total labor force level, a comparison of replacement rates between editions does show some effect of the revisions made. The overall replacement rate in FY 1980 was revised from .0354 to .0315 between editions. Correspondingly, employment was revised upward from 1.56 million to 1.59 million. The combination of these factors produces overall replacement needs that are about ten percent lower in the third edition.

Methodology Improvements

The system of computer programs that produced the forecast was revised to take advantage of the newly available BLS Industry-Occupation Matrix. Since this data base includes both a base year (1974) and a target year (1985), it is possible to interpolate occupational staffing patterns from the employment data on the matrix. The computer system used for the third edition therefore accounts for shifts in the industry-occupation structure of the labor force expected to occur over the next few years. A similar capability was installed for the replacement rates. The current system now determines replacement rates from data provided by BLS in a base year (1972) and a target year (1980). The rates for the intervening years are interpolated linearly. Replacement rates for the years after 1980 are held constant at the 1980 value, since there is no basis for their projection. As a result of these improvements, the system is now more sensitive to fluctuations in the labor force structure.

Comparing the Forecasts

The above discussion shows that changes in the JOF between the second and third editions are due to a combination of many factors. These revisions all contribute to slightly different, and hopefully improved, forecast results. These factors combine differently for each program, making it difficult to compare the results at the program level. However, at the vocational field level, a few major trends are apparent.

To examine these trends, the employment forecasts for vocational fields will be compared. This will be done for Section 1, current vocational programs. Fiscal year 1980 was selected for the comparison. The vocational employment reported in Section 1 increases by seven percent in this edition. A shifting of many of the potential/emerging programs of the second edition to Section 1 is largely responsible for this increase. (As a point of reference, the combined employment for all sections in the third edition is two percent higher than that of the second.)

The table below compares the employment reported for each vocational field in the two editions. Employment levels increase in all fields, but some levels increase more than others. Fields assuming a greater share of Section 1 employment are Home and Family Life Occupations, Distributive Education Occupations, Health Occupations, and Technical Occupations. Fields assuming a lesser share are Business and Office Occupations, Trade and Industrial Occupations, and Agricultural Occupations. This comparison does not imply that one field will grow faster or slower than another in the forecast. Rather, the share changes are brought about by the system improvements and revisions made between editions.

EMPLOYMENT BY VOCATIONAL FIELDS FOR SECOND AND THIRD EDITIONS

		JOF II (1980)	Percent Share	JOF III (1980)	Percent Share	Share Change
01.00.00	Agriculture	113,103	9.3%	118,859	9.1%	-0.2%
04.00.00	Distributive Education	262,036	21.6%	302,535	23.2%	+1.6%
07.00.00	Health	78,567	6.5%	88,210	6.8%	+0.3%
09.00.00	Home and Family	23,314	1.9%	28,168	2.1%	+0.2%
14.00.00	Business and Office	291,347	24.0%	296,618	22.8%	-1.2%
16.00.00	Technical	66,182	5.5%	75,191	5.8%	+0.3%
17.00.00	Trade and Industrial	378,090	31.2%	392,788	30.2%	-1.0%
Section 1 - Vocational Programs		1,212,639	100.0%	1,302,369	100.0%	(+7.0%)*
Total - All Employment		1,561,509	-	1,592,398	-	(+2.0%)*

*These figures are not share changes but rather the percentage increase of employment between JOF II and JOF III.

3. SUMMARY OF THE FORECAST

This section gives an overview of the forecast results presented in detail in Part IV. A discussion of the overall economic outlook for the state of Washington is followed by a summary of the forecast by vocational and professional fields. The section concludes with tables showing forecast highlights broken down and ranked according to various parameters. All years are given as fiscal years unless otherwise indicated.

The Overall Economic Outlook

The third edition of the *Job Opportunities Forecast* shows a strong growth of employment in Washington State during the latter part of this decade, and a much slower growth during the first half of the 1980's. The average annual growth of total employment is expected to be about 3.0 percent per year through 1980. Between 1980 and 1985 the growth is expected to decline to about 2.0 percent per year. This slowdown in the growth of employment means there will be fewer new job openings in the early 1980's than in the late 1970's. A fuller discussion of the economic outlook for Washington State is presented in the Appendix of this report.

The statewide employment level is expected to rise from 1.42 million in 1976 to 1.76 million in 1985. The expansion of the economy alone will account for 340,000 new jobs over this nine-year period (an average of about 38,000 jobs per year). When replacement needs (which account for additional job opportunities due to labor force separations) are added to the jobs created by expansion, the total job opportunities grow to a level of 794,000. This represents an average demand of 88,200 jobs per year.

Overall Occupational Outlook

In this section the forecast is summarized. The twelve year forecast period can be conveniently broken into three parts: FY 1974-77, FY 1977-80, and FY 1980-85. The analysis of the forecast will be based on these shorter periods.

Growth of employment in occupations related to vocational skills follow very closely the growth expected for total employment. This employment reported in Part IV, Section 1 accounts for about 1.36 million jobs over 1977-1980. An additional 42,000 jobs are potentially related to vocational skills, but corresponding educational programs have not been developed. (These jobs, reported in Section 2 of the forecast, are not included in the discussion below.) The fastest-growing vocational fields will be Technical (4.0 percent)* and Business and Office (3.5 percent). Fields growing at approximately the same rate as the total labor force are Health (3.4 percent), Trade and Industrial (3.3 percent), and Distributive Education (3.2 percent). The slowest-growing fields are Home and Family Life (2.0 percent) and Agriculture (1.4 percent). This ranking considers only the rate of employment

*Average growth rate 1977-80 in jobs per year.

increase expected each year. The employment level varies considerably from field to field. Ranking by employment level is discussed below. For the period 1980-85 vocational employment maintains the same growth ranking as for the period 1977-80. However, the annual growth rates are somewhat slower for all programs in this latter period.

Vocational job opportunities are concentrated in three fields: Trades and Industrial, Business and Office, and Distributive Education. These three fields account for more than three-fourths of the total job opportunities for vocational employment. Job opportunities due to expansion and job opportunities due to labor force separations are both included in the total. Below is a ranking of the seven vocational fields for Section 1 of the forecast. The average number of new jobs per year (demand) is given, together with the employment level for each field. The figures are based on averaged forecast results for 1977 through 1980.

			Percent Demand	Demand	Employment
1.	17.00.00	Trades and Industrial	28.8	22,040	374,621
2.	14.00.00	Business and Office	23.5	18,026	282,291
3.	04.00.00	Distributive Education	23.4	17,950	288,754
4.	01.00.00	Agricultural	8.4	6,421	118,900
5.	07.00.00	Health	7.8	5,943	8,404
6.	16.00.00	Technical	6.1	4,633	71,021
7.	09.00.00	Home and Family Life	2.0	1,546	27,400
	Total - Vocational Education		100.0	76,560	1,355,274

Professional occupations, those presented in Section 3 of the forecast, account for about 111,000 jobs. The professional education programs presented in this forecast represent only a portion of all professionally related programs offered in the state. On the basis of the programs selected for Section 3, the forecast indicates an average annual growth of 2.2 percent in the period 1977-80. This growth drops to about 1.0 percent per year for 1980-85. It is not possible to say how these rates, derived for a limited number of professional programs, apply to professional occupations in general.

In addition to the jobs reported in Section 1 (vocational employment corresponding to educational programs currently offered), Section 2 (vocational employment corresponding to potential programs), and Section 3 (professional employment), there are 127,000 other jobs not captured by the above sections. These other occupations make up about 8.3 percent of the total state employment, or 7.2 percent of all job opportunities.

Highlights of the Occupational Forecast

The following pages present highlights of the forecast. Key statistics are given in a series of tables that group the results of the forecast in various ways. Narrative descriptions of the information in many of these tables are also provided. The first three tables present forecast results for each section, i.e., for current vocational programs, potential vocational programs, and for professional programs. The information in these tables are based upon the total of all programs in each section. The next seven tables breakdown the forecast for current vocational programs (Section 1) by vocational field. Again, each table presents results summed from the individual programs within a given field. In addition to key statistics for the section or field as a whole, individual programs are highlighted. This is done by selecting those programs that contribute the majority of job opportunities to a given section or field. Frequently, 70 or 80 percent of the job opportunities are accounted for by about 30 percent of the programs.

To conclude the section, a set of tables rank individual programs according to various other parameters, without regard to section or field. These ranking parameters include employment levels, growth rates, replacement opportunities, expansion opportunities and total demand. Keep in mind that within the highlight tables, as well as within the detailed forecast, the term "program" refers to program skills representing a given occupational classification. The employment demand for these skills is supplied in part from the output of the educational program and in part from other sources. By reviewing these tables the user can gain an overview of the detailed information presented in Part IV. Again, the user of the forecast is requested to review the section on interpreting the forecast results (page 21) before using any of the data presented in the analysis which follows.

HIGHLIGHTS BY FORECAST SECTION

Section 1 Vocational Education Programs

Section 1 includes 182 vocational education programs currently offered in the state of Washington. These programs represent 72 percent of all educational programs included in the Job Opportunities Forecast (Sections 1-3). The forecast reports 76,600 total job opportunities per year for Section 1 programs for the period FY 1977-80. This represents 84 percent of the total job opportunities in the state.* Twenty-three programs, selected to highlight the Section 1 forecast, are presented on the opposite page. The programs are ranked according to the average demand per year during FY 1977-80. This summary, while representing only 12 percent of the section's programs, accounts for nearly 60 percent of the job opportunities.

The rate of employment growth associated with this section is expected to be 3.1 percent per year during FY 1977-80. The growth rate drops to 2.0 percent per year for the period FY 1980-85. This sharp decline in the expansion of the economy reflects the assumptions of the Long Term Employment Forecast (the Economic Forecast) presented in the Appendix. Employment levels related to vocational education programs in Section 1 range from 1.1 million in FY 1974 to over 1.4 million in FY 1985. During FY 1977-80, Section 1 employment represents 89 percent of the total employment in the state. This percentage is greater than that reported in the second edition of the JOF. The increase in this third edition is due mainly to the transfer of programs from Section 2 (Potential/Emerging) into Section 1 (Current Vocational programs).

Replacement opportunities account for 45 percent of total job opportunities in FY 1974. This share grows to 67 percent in FY 1985. Two factors contribute to the increased significance of replacement opportunities. First, the slowdown in the economy after FY 1980 will reduce the number of expansion opportunities. Second, the rate at which workers are expected to separate from the labor force (and thus create replacement opportunities) is expected to grow. Between FY 1974 and FY 1985, the replacement rate for Section 1 as a whole will grow from .0291 to .0324. These rates show that replacement opportunities are expected to be between 2.91 percent and 3.24 percent of the employment level in the corresponding year.

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*Vocational education programs are not the sole supply of workers filling these positions. This demand matches vocational skills that might be acquired in a number of ways such as military apprenticeship and on-the-job training programs.

HIGHLIGHTS BY FORECAST SECTION

Section 1 Vocational Education Programs

Total Programs	182	
Average Demand 1977-1980*	76,560	jobs per year
Share of All Sections	84.5%	of total demand
	72.5%	of total programs
Highlight Programs	23	
Average Demand 1977-1980	45,038	jobs per year
Share of This Section	58.8%	of section demand
	12.6%	of section programs
Employment Level 1977-1980	1,355,274	average
Growth Rate 1977-1980	3.1%	per year
Growth Rate 1980-1985	2.0%	per year
Replacement Rate 1976	.0299	

	Highlight Programs	Average Demand Per Year
04.08.00	Marketing and Sales	5,902
14.07.00	Secretarial Science	4,018
14.01.01	Accounting	3,352
01.02.00	Agricultural Business	2,794
17.29.02	Commercial Cooking and	2,497
04.02.00	Fashion Merchandising	2,475
17.29.04	Waiter/Waitress	2,429
17.23.02	Machine Shop	1,945
01.01.00	Agricultural Production	1,723
17.03.99	Commercial Driving	1,663
14.08.05	Business Management	1,583
17.11.00	Custodial Services	1,577
16.05.98	Executive Housekeeping Technology	1,458
17.10.01	Carpentry	1,341
17.12.00	Diesel and Heavy Equipment Mechanics	1,324
14.09.00	Typist (and Related Occupations)	1,216
14.05.04	Stock and Inventory Clerk	1,209
14.02.00	Data Processing	1,203
07.03.02	Practical Nursing	1,154
04.06.00	Cashier/Checker	1,090
04.99.00	Purchasing Management	1,039
04.17.00	Real Estate	1,035
14.07.95	Insurance Secretary	1,011
	Highlight Demand	45,038
	Remainder of Section	31,022
	Section Total	76,560

*All years are fiscal years.

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Section 2 Potential/Emerging Vocational Education Programs

Section 2 of the Job Opportunities Forecast includes those occupations which are appropriate for vocational education, but for which no program currently exists in the public sector. There are 26 such potential programs in the section. These programs represent just over ten percent of all programs in the forecast. The total job opportunities expected per year for this section during FY 1977-80 are just over 2,300 positions. Nine of these Section 2 programs, or 35 percent, are highlighted in the table on the opposite page. Seventy-eight percent of the 2,300 job opportunities are related to these nine potential programs.

Employment for this section is expected to grow at a rate of 3.5 percent per year over the period FY 1977-80. This rate will drop to 2.2 percent over the period FY 1980-85. These rates are slightly higher than the corresponding rates presented for Section 1. Levels of employment will range from 38,000 in FY 1977 to 49,000 in FY 1985. During FY 1977-80, Section 2 employment represents 2.7 percent of the total employment in the state.

Replacement opportunities account for 36 percent of total job opportunities in FY 1974. This proportion grows to 66 percent by FY 1985, due to an increase in the replacement rate and a corresponding decrease in expansion opportunities. Replacement rates range from .0232 in FY 1974 to .0256 in FY 1985. These rates are lower than corresponding rates for current vocational programs (Section 1), but slightly higher than rates for professional occupations (Section 3).

HIGHLIGHTS BY FORECAST SECTION

Section 2 Potential/Emerging Vocational Programs

Total Programs	26	
Average Demand 1977-1980*	2,344	jobs per year
Share of All Sections	2.6%	of total demand
	10.4%	of total programs
Highlight Programs	9	
Average Demand 1977-1980	1,830	jobs per year
Share of This Section	78.1%	of section demand
	34.6%	of section programs
Employment Level 1977-1980	41,678	average
Growth Rate 1977-1980	3.5%	per year
Growth Rate 1980-1985	2.2%	per year
Replacement Rate 1976	.0241	

	Highlight Programs	Average Demand Per Year
17.23.04X	Assemblers	578
17.10.07X	Plumbers	465
14.04.01X	Telephone Operators	212
17.32.00X	Stationary Engineers and Firemen	138
17.23.97X	Metal Working Trades, Nec**	116
17.29.95X	Butchers	96
17.99.99X	Checkers, Manufacturing	79
17.10.10X	Roofers	78
17.10.96X	Carpet Installers	68
	Highlight Demand	1,830
	Remainder of Section	514
	Section Total	2,344

* All years are fiscal years.
** Not elsewhere classified.

HIGHLIGHTS BY FORECAST SECTION

Section 3 Professional Occupations

Professional education programs are included in the Job Opportunities Forecast for the first time. The initial attempt to capture employment demand for professional occupations is based upon 43 programs. This limited selection includes both current and potential programs requiring four years or longer to complete. Professional occupations which overlap skills developed in vocational education programs are not included in this section. These skills are reported in the section for vocational education. Examples of this case include nursing and accounting. Before a comprehensive forecast for professional education can be developed, the problems relating to the overlap of skills must be resolved. For now, this limited forecast is a first step in that process, i.e., identifying some of the non-overlap programs. While the results presented in Section 3 of the forecast have some validity at the level of individual programs, the section summary presented on the opposite page captures only a portion of all professional employment opportunities. The summary data are included mainly to preserve continuity in the analysis and not to be used in educational program planning.

HIGHLIGHTS BY FORECAST SECTION

Section 3 Professional Education Programs

Total Programs	43	
Average Demand 1977-1980*	5,156	jobs per year
Share of All Sections	5.7%	of total demand
	17.1%	of total programs
Highlight Programs	19	
Average Demand 1977-1980	4,171	jobs per year
Share of This Section	80.9%	of section demand
	44.2%	of section programs

	Highlight Programs	Average Demand Per Year
99.0802	Elementary School Teachers	842
99.0501	Lawyers	506
99.1206	Physicians, MD and Osteopaths	447
99.1204	Dentists	283
99.1211	Pharmacists	269
99.0909	Engineers, Electrical	266
99.0908	Engineers, Civil	228
99.0902	Engineers, Aero-Astronautic	219
99.0910	Engineers, Mechanical	214
99.0808	Secondary School Teachers	205
99.1004	Musicians and Composers	201
99.0827	School Admin, Elem, Secondary	191
99.0200	Architects	168
99.0900	Engineers, Others	132
99.0913	Engineers, Industrial	127
99.0805	Misc Coll and Univ Teach	106
99.0823	Preschool, Kindergarten	92
99.1218	Veterinarians	81
99.2204	Economists	78
	Highlight Demand	4,171
	Remainder of Section	985
	Section Total	5,156

*All years are fiscal years. The Section 3 forecast has limited application. See narrative on opposite page.

HIGHLIGHTS BY VOCATIONAL FIELD

01.00.00 Agricultural Occupations

The Agricultural field includes 11 programs. The available job opportunities for the field average just over 6,400 jobs per year for FY 1977-80. This represents 8.4 percent of all job opportunities associated with current vocational education programs (Section 1). Three programs were selected to highlight the demand forecast. These three represent 27 percent of all vocational programs in the agricultural field and account for 79 percent of the demand for employment, or just over 5,000 jobs.

The employment level for the field is expected to grow by 1.4 percent per year for FY 1977-80, and by 0.8 percent per year for FY 1980-85. Agricultural occupations represent the slowest growing of the seven vocational fields presented in these highlight tables. The employment level for the field is expected to grow from 110,300 jobs in FY 1974 to 124,100 jobs in FY 1985. The average annual employment for the FY 1977-80 period is 119,000 jobs. During FY 1977-80, employment for this field represents just under one percent of all employment associated with current vocational education programs. Agricultural employment not appropriate to vocational education is excluded from the above breakdown.

Replacement opportunities account for most of the job opportunities in the field. The overall field replacement rate grows from .0388 in FY 1977 to .0422 in FY 1985. This means that replacement opportunities will account for an increasing share of the demand for employment, growing from 70 percent in FY 1977 to 89 percent in FY 1985. The increasing share of demand based on replacement is due to more than growing replacement rates; expansion opportunities are declining slightly during FY 1980-85.

HIGHLIGHTS BY VOCATIONAL FIELD

01.00.00 Agricultural Occupations

Total Programs	11	
Average Demand 1977-1980*	6,421	jobs per year for field
Share of All Fields	8.4%	of Section 1 demand
	6.0%	of Section 1 programs
Highlight Programs	3	
Average Demand 1977-1980	5,001	jobs per year
Share of This Field	77.9%	of demand is in
	27.2%	of programs
Employment Level 1977-1980	118,900	average
Growth Rate 1977-1980	1.4%	per year
Growth Rate 1980-1985	0.8%	per year
Replacement Rate 1976	.0377	

	Highlight Programs	Average Demand Per Year
01.02.00	Agricultural Business	2,794
01.01.00	Agricultural Production	1,723
01.03.01	Agricultural Mechanics	484
	Highlight Demand	5,001
	Remainder of Field	1,420
	Field Total	6,421

*All years are fiscal years.

HIGHLIGHTS BY VOCATIONAL FIELD

04.00.00 Distributive Education Occupations

The Distributive Education field includes 22 programs. The available job opportunities in this field are expected to average just under 18,000 jobs per year for FY 1977-80. This represents 23.4 percent of all job opportunities associated with current vocational education programs (Section 1). Eleven programs, representing 50 percent of the field's programs, were selected to highlight the demand forecast. The highlight programs capture just under 90 percent of the demand in the field. As such, the job opportunities within the field are more evenly distributed among its programs than in most of the other vocational education fields.

The growth rate of employment within the field is expected to range from 3.2 percent per year (for FY 1977-80), to 2.2 percent per year (FY 1980-85). Employment growth in this field is slightly above the average for all vocational education fields. The employment level is expected to range from 225,000 jobs in FY 1974 to 337,000 jobs in FY 1985. During FY 1977-80, the employment level for this field represents just over 21 percent of all employment associated with vocational education programs.

Replacement opportunities will account for an increasing share of the total job opportunities, growing from 50 percent in FY 1977 to 66 percent in FY 1985. This is mainly due to the growth in replacement rates, from .0304 to .0323 during the same period. The level of these replacement rates indicates that just over three percent of the workers in this field will separate from the labor force each year, creating job opportunities for other workers.

HIGHLIGHTS BY VOCATIONAL FIELD

04.00.00 Distributive Education Occupations

Total Programs	22	
Average Demand 1977-1980*	17,950	jobs per year
Share of All Fields	23.4%	of Section 1 demand
	12.1%	of Section 1 programs
Highlight Programs	11	
Average Demand 1977-1980	14,315	jobs per year
Share of This Field	79.7%	of field demand
	50.0%	of field programs
Employment Level 1977-1980	288,754	average
Growth Rate 1977-1980	3.2%	per year
Growth Rate 1980-1985	2.2%	per year
Replacement Rate 1976	.029	

	Highlight Programs	Average Demand Per Year
04.08.00	Marketing and Sales	5,902
04.02.00	Fashion Merchandising	2,475
04.06.00	Cashier/Checker	1,090
04.99.00	Purchasing Management	1,039
04.17.00	Real Estate	1,035
04.10.00	Interior Merchandising	845
04.11.00	Hotel, Motel, Restaurant Management	620
04.06.98	Supermarket Management	612
04.19.00	Transportation	589
04.03.00	Parts Merchandising	585
04.07.00	Club and Tavern Management	558
	Highlight Demand	14,315
	Remainder of Field	3,635
	Field Total	17,950

*All years are fiscal years.

HIGHLIGHTS BY VOCATIONAL FIELD

07.00.00 Health Occupations

The Health field includes 29 programs. The available job opportunities for the field are expected to average just under 7,000 jobs per year for the period FY 1977-80. This represents 7.8 percent of all job opportunities associated with current vocational education programs (Section 1). Eight programs, or 28 percent of the field's programs, were selected to highlight the demand forecast. The highlight programs capture just under 79 percent of the demand in the Health field.

The growth rate of employment within the field is expected to range from 3.4 percent per year (FY 1977-80), to 2.4 percent per year (FY 1980-85). Employment growth in this field is slightly above the average for all vocational education fields. The employment level is expected to range from 71,000 jobs in FY 1974, to 99,000 jobs in FY 1985. During FY 1977-80, the employment level for this field represents just over six percent of all employment associated with vocational education programs.

Replacement opportunities will grow from 53 percent in FY 1977 to 63 percent in FY 1985. Replacement rates will grow from .0374 to .0380 during the same period. Replacement rates in Health occupations are the highest of all vocational fields. However, replacement rate increases in Health occupations are expected to be much less than in other fields.

HIGHLIGHTS BY VOCATIONAL FIELD

07.00.00 Health Occupations

Total Programs	29	
Average Demand 1977-1980*	5,943	jobs per year
Share of All Fields	7.8%	of Section 1 demand
	15.9%	of Section 1 programs
Highlight Programs	8	
Average Demand 1977-1980	4,678	jobs per year
Share of This Field	78.7%	of field demand
	27.6%	of field programs
Employment Level 1977-1980	8,404	average
Growth Rate 1977-1980	3.4%	per year
Growth Rate 1980-1985	2.4%	per year
Replacement Rate 1976	.0372	

	Highlight Programs	Average Demand Per Year
07.03.02	Practical Nursing	1,154
07.03.01	Registered/Associate Degree Nursing	874
07.03.03	Nurses Aide/Nursing Assisting	765
07.01.01	Dental Assisting	555
07.03.99	Gerontology Aide	534
07.99.02	Nursing Home Administration	312
07.99.03	Pharmacy Assisting	269
07.09.04	Medical Assisting	215
	Highlight Demand	4,678
	Remainder of Field	1,265
	Field Total	5,943

*All years are fiscal years.

HIGHLIGHTS BY VOCATIONAL FIELD

09.00.00 Home and Family Life Occupations

The Home and Family Life field includes five programs. The available job opportunities for the field are expected to average just over 1,300 jobs per year for FY 1977-80. This represents 2.0 percent of all job opportunities associated with current vocational education programs (Section 1). Four programs, or 80 percent of the field's programs, were selected to highlight the demand forecast. The highlight programs capture almost 88 percent of the demand in the field. As such, the job opportunities within the field are more evenly distributed among its programs than in most of the other vocational education fields. This even distribution is mostly due to the small number of programs in the field.

The growth rate of employment within the field is expected to range from 2.0 percent per year (FY 1977-80) to 0.9 percent per year (FY 1980-85). Employment growth in this field is well below the average for all vocational education fields. The employment level is expected to range from 25,000 jobs in FY 1974 to 29,500 jobs in FY 1985. During FY 1977-80, the employment level for this field represents just over two percent of all employment associated with vocational education programs.

Replacement rates for the field will grow from .0371 in FY 1974 to .0373 in FY 1985. Correspondingly, replacement opportunities will account for an increasing share of the total job opportunities, growing from 61 percent in FY 1977 to 82 percent in FY 1985. Replacement rates for this field are among the highest of vocational education fields, exceeded only by Health occupations.

HIGHLIGHTS BY VOCATIONAL FIELD

09.00.00 Home and Family Life Occupations

Total Programs	5	
Average Demand 1977-1980*	1,546	jobs per year
Share of All Fields	2.0%	of Section 1 demand
	2.7	of Section 1 programs
Highlight Programs	4	
Average Demand 1977-1980	1,357	jobs per year
Share of This Field	87.8%	of field demand
	80.0%	of field programs
Employment Level 1977-1980	27,400	average
Growth Rate 1977-1980	2.0%	per year
Growth Rate 1980-1985	0.9%	per year
Replacement Rate 1976	.0371	

	Highlight Programs	Average Demand Per Year
09.02.98	Human Service	463
09.02.01	Care and Guidance of Children	429
09.02.97	Alcoholism Counseling	273
09.02.99	Social Service	192
	Highlight Demand	1,357
	Remainder of Field	189
	Field Total	1,546

*All years are fiscal years.

HIGHLIGHTS BY VOCATIONAL FIELD

14.00.00 Business and Office Occupations

The Business and Office field includes 23 programs. Job opportunities projected for the field average over 18,000 jobs for FY 1977-80. This represents 24 percent of all job opportunities associated with current vocational education programs (Section 1). Eight programs were selected to highlight the demand forecast. These programs capture almost 80 percent of the demand for employment in this field, while representing only 35 percent of the field's programs.

The rate of employment growth in this field, at 3.5 percent per year during FY 1977-80, is much greater than that of most other vocational education fields. After the economic slowdown expected in the early 1980's, employment is projected to grow at 2.4 percent a year. Even at this slower growth rate, Business and Office occupations will continue to be one of the leaders in vocational education employment. Employment levels for the field range from 247,000 in FY 1974, to 334,000 jobs in FY 1985. This represents 18.5 percent of all employment associated with vocational education programs during FY 1977-80.

Replacement opportunities, which accounted for 42 percent of total job opportunities in FY 1974, are expected to increase to 62 percent by FY 1985. This is mainly because replacement rates will increase from .0294 to .0319 during that period. These replacement rates are among the highest in vocational employment fields.

HIGHLIGHTS BY VOCATIONAL FIELD

14.00.00 Business and Office Occupations

Total Programs	23	
Average Demand 1977-1980*	18,026	jobs per year
Share of All Fields	23.6%	of Section 1 demand
	12.6%	of Section 1 programs
Highlight Programs	8	
Average Demand 1977-1980	14,409	jobs per year
Share of This Field	79.9%	of field demand
	34.8%	of field programs
Employment Level 1977-1980	282,291	average
Growth Rate 1977-1980	3.5%	per year
Growth Rate 1980-1985	2.4%	per year
Replacement Rate 1976	.0302	

	Highlight Programs	Average Demand Per Year
14.07.00	Secretarial Science	4,018
14.01.01	Accounting	3,352
14.08.05	Business Management	1,583
14.09.00	Typist (and Related Occupations)	1,216
14.05.04	Stock and Inventory Clerk	1,209
14.02.00	Data Processing	1,203
14.07.95	Insurance Secretary	1,011
14.07.96	Real Estate Secretary	817
	Highlight Demand	14,409
	Remainder of Field	3,617
	Field Total	18,026

*All years are fiscal years.

HIGHLIGHTS BY VOCATIONAL FIELD

16.00.00 Technical Occupations

The Technical field includes 30 programs. Next to the Trade and Industrial field, Technical occupations have more programs than any other vocational field. Job opportunities in this field are projected to be 4,600 positions per year during FY 1977-80. This represents 6.0 percent of the employment demand for Section 1. Nine programs were selected to highlight the demand forecast. They represent 30 percent of the programs in the field and capture 79 percent of the field's employment demand.

Although not the largest field in terms of employment and job opportunities, Technical occupations are the fastest growing. Its 4.0 percent annual growth rate for FY 1977-80 puts Technical occupations well above the average rate of growth of 3.1 percent a year projected for all vocational education programs in Section 1. Although the rate of growth declines sharply after FY 1980, other fields show a similar decline. Technical occupations remain the leader in growth. Employment levels in the field range from 62,000 jobs in FY 1974 to 86,000 jobs in FY 1985. During FY 1977-80, the average employment level represents less than five percent of all vocational employment in Section 1.

Of the vocational fields in Section 1, Technical occupations have the lowest replacement rates. They range from .0267 in FY 1974 to .0300 in FY 1985. With the relatively low turnover of workers, replacement opportunities are accordingly low. They represent from 35 percent (FY 1974) to 60 percent (FY 1985) of the total job opportunities available. The low proportion of replacement opportunities in this field is due not only to the low replacement rate but also to the relatively high level of expansion opportunities.

HIGHLIGHTS BY VOCATIONAL FIELD

16.00.00 Technical Occupations

Total Programs	30	
Average Demand 1977-1980*	4,633	jobs per year
Share of All Fields	6.0%	of Section 1 demand
	16.5%	of Section 1 programs
Highlight Programs	9	
Average Demand 1977-1980	3,645	jobs per year
Share of This Field	78.7%	of field demand
	30.0%	of field programs
Employment Level 1977-1980	71,020	average
Growth Rate 1977-1980	4.0%	per year
Growth Rate 1980-1985	2.7%	per year
Replacement Rate 1976	.0204	

	Highlight Programs	Average Demand Per Year
16.05.98	Executive Housekeeping Technology	1,458
16.02.03	Food Processing Technology	713
16.01.07	Electrical Power Technology	428
16.01.95	Communications Electronics	195
16.01.98	Aviation Electronics	189
16.01.08	Electronic Technology	177
16.01.94	Quality Control Technology	172
16.01.11	Industrial Technology	161
16.01.06	Civil Engineering Technology	152
	Highlight Demand	3,645
	Remainder of Field	988
	Field Total	4,633

*All years are fiscal years.

HIGHLIGHTS BY VOCATIONAL FIELD

17.00.00 Trade and Industrial Occupations

The Trade and Industrial field is by far the largest of the seven vocational fields of Section 1. Trade and Industrial occupations include 62 programs, more than twice the number in the next largest field. With its especially large share of the vocational programs (34 percent), it has the largest employment level (375,000) and the greatest number of job opportunities (22,000). Of the total job opportunities for programs in Section 1, Trade and Industrial occupations have a 29 percent share. Of the employment level, this field has a 28 percent share. These comparisons are based on the period FY 1977-80 and represent average annual values.

Highlights include 15 programs, or 24 percent of the field. These programs represent 17,500 job opportunities, or 79 percent of the field, indicating that many of the highlight programs have especially high employment demand.

Growth of employment level for the field is slightly above the average for Section 1. The growth rate is 3.3 percent per year over FY 1977-80. As with other fields, this rate declines sharply after FY 1980. The rate for the FY 1980-85 period is 2.1 percent per year. Levels of employment range from 1,106,000 in FY 1974 to 1,447,000 in FY 1985.

Replacement opportunities account for 45 percent of the total job opportunities in FY 1974. This share will grow to 67 percent by FY 1985, due to projected increases in the replacement rates. The replacement rate for the field is one of the lowest among the vocational fields in Section 1, ranging from .0291 in FY 1974 to .0324 in FY 1985.

HIGHLIGHTS BY VOCATIONAL FIELD

17.00.00 Trade and Industrial Occupations

Total Programs	62	
Average Demand 1977-1980*	22,042	jobs per year
Share of All Fields	28.8%	of Section 1 demand
	34.1%	of Section 1 programs
Highlight Programs	15	
Average Demand 1977-1980	17,490	jobs per year
Share of This Field	79.3%	of field demand
	24.2%	of field programs
Employment Level 1977-1980	374,621	average
Growth Rate 1977-1980	3.3%	per year
Growth Rate 1980-1985	2.1%	per year
Replacement Rate 1976	.0267	

	Highlight Programs	Average Demand Per Year
17.29.02	Commercial Cooking	2,497
17.29.04	Waiter/Waitress	2,429
17.23.02	Machine Shop	1,945
17.03.99	Commercial Driving	1,663
17.11.00	Custodial Services	1,577
17.10.01	Carpentry	1,341
17.12.00	Diesel and Heavy Equipment Mechanics	1,324
17.23.06	Welding	819
17.26.02	Cosmetology	810
17.03.02	Automotive Mechanics	800
17.28.02	Administration of Justice	542
17.14.01	Industrial Electricity	520
17.10.03	Heavy Equipment Operation	509
17.04.01	Aircraft Mechanics	363
17.10.99	Industrial Maintenance Technology	351
	Highlight Demand	17,490
	Remainder of Field	4,552
	Field Total	22,042

*All years are fiscal years.

HIGHLIGHTS BY EDUCATIONAL PROGRAM

Educational Programs Ranked by Occupational Employment

The Top Ten Programs			Employment	Annual Growth Rate	Total Demand
1.	04.08.00	Marketing and Sales	89,797	3.4%	5,902
2.	14.01.01	Accounting	58,872	2.5%	3,352
3.	14.07.00	Secretarial Science	51,228	4.8%	4,018
4.	01.02.00	Agricultural Business	48,191	2.2%	2,794
5.	17.03.99	Commercial Driving	41,877	2.1%	1,663
6.	17.29.04	Waiter/Waitress	37,342	3.9%	2,429
7.	17.29.02	Commercial Cooking and	34,562	4.1%	2,497
8.	17.23.02	Machine Shop	33,306	4.0%	1,945
9.	04.02.00	Fashion Merchandising	33,081	4.4%	2,475
10.	01.01.00	Agricultural Production	32,680	.4%	1,723

The Next Ten Programs			Employment	Annual Growth Rate	Total Demand
11.	14.05.04	Stock and Inventory Clerk	25,947	3.0%	1,209
12.	14.08.05	Business Management	23,793	3.6%	1,583
13.	17.10.01	Carpentry	21,939	3.1%	1,341
14.	17.12.00	Diesel and Heavy Equipment Mechanics	21,679	4.1%	1,324
15.	14.02.00	Data Processing	20,038	4.3%	1,203
16.	99.0802	Elementary School Teachers	19,859	.6%	842
17.	17.11.00	Custodial Services	19,216	3.2%	1,577
18.	16.05.98	Executive Housekeeping Technology	18,314	3.0%	1,458
19.	14.09.00	Typist (and Related Occupations)	18,269	3.5%	1,216
20.	04.06.00	Cashier/Checker	18,059	3.3%	1,090

Based on average annual forecast for fiscal years 1977-1980.

HIGHLIGHTS BY EDUCATIONAL PROGRAM

Educational Programs Ranked by Employment Growth Rate

The Ten Fastest-Growing Programs			Annual Growth Rate	Employ-ment	Total Demand
1.	17.04.01	Aircraft Mechanics	6.8%	5,962	363
2.	16.01.98	Aviation Electronics	6.4%	3,152	189
3.	99.1204	Dentists	6.1%	2,794	283
4.	99.0902	Engineers, Aero-Astronautic	6.1%	4,472	219
5.	99.0910	Engineers, Mechanical	5.9%	3,192	214
6.	17.06.00	Office Machine Repair	5.9%	1,890	138
7.	16.01.13	Mechanical Engineering Tech.	5.9%	1,994	133
8.	17.13.00	Drafting	5.8%	3,097	198
9.	01.02.98	Animal Technology	5.6%	2,889	237
10.	17.23.06	Welding	5.4%	11,555	819

The Ten Slowest-Growing Programs			Annual Growth Rate	Employ-ment	Total Demand
1.	07.03.07	Home Health Aide	-2.9%	4,142	86
2.	14.02.02	Keypunch	-1.3%	2,935	45
3.	99.0803	Secondary School Teachers	-1.1%	16,436	205
4.	99.0805	Misc. Coll. and Univ. Teachers	-1.0%	9,887	106
5.	09.02.01	Care and Guidance of Children	-.7%	11,161	429
6.	17.26.01	Barbering	-.6%	2,853	156
7.	01.07.00	Industrial Forestry	-.4%	10,174	247
8.	17.28.01	Fire Science/Fireman (Paid)	.0%	4,205	47
9.	99.0823	Preschool, Kindergarten	.3%	2,595	92
10.	01.01.00	Agricultural Production	.4%	32,680	1,723

Based on average annual forecast for fiscal years 1977-1980 with employment level over 1,200.

HIGHLIGHTS BY EDUCATIONAL PROGRAM

Educational Programs Ranked by Replacement Opportunities

The Top Ten Programs			Replacement Opportunities	Total Demand
1.	04.08.00	Marketing and Sales	2,981	5,902
2.	14.01.01	Accounting	1,949	3,352
3.	01.02.00	Agricultural Business	1,778	2,794
4.	14.07.00	Secretarial Science	1,724	4,018
5.	01.01.00	Agricultural Production	1,580	1,723
6.	17.29.02	Commercial Cooking and	1,160	2,497
7.	04.02.00	Fashion Merchandising	1,104	2,475
8.	17.29.04	Waiter/Waitress	1,062	2,429
9.	17.11.00	Custodial Services	979	1,577
10.	16.05.98	Executive Housekeeping Technology	930	1,458

The Next Ten Programs			Replacement Opportunities	Total Demand
11.	17.23.02	Machine Shop	823	1,945
12.	14.08.05	Business Management	759	1,583
13.	17.03.99	Commercial Driving	754	1,663
14.	04.17.00	Real Estate	750	1,035
15.	99.0802	Elementary School Teachers	711	842
16.	17.10.01	Carpentry	671	1,341
17.	14.09.00	Typist (and Related Occupations)	619	1,216
18.	07.03.01	Registered/Associate Degree Nursing	565	874
19.	07.03.02	Practical Nursing	559	1,154
20.	04.06.00	Cashier/Checker	529	1,090

Based on average annual forecast for fiscal years 1977-1980.

HIGHLIGHTS BY EDUCATIONAL PROGRAM

Educational Programs Ranked by Replacement Rates

Ten Programs With the Highest Replacement Rates

		Program Title	1976 Rate
1.	99.1216	Podiatrists	.0798
2.	99.2208	Sociologists	.0627
3.	17.99.00	Musical Instrument Repair	.0604
4.	17.26.01	Barbering	.0544
5.	99.1221	Chiropractors	.0536
6.	17.33.01	Custom Apparel Design	.0529
7.	17.33.02	Tailoring	.0526
8.	17.21.00	Instrument Maintenance, Production	.0509
9.	17.21.02	Instrument and Watch Repair	.0509
10.	07.03.07	Home Health Aide	.0501

Ten Programs With the Lowest Replacement Rates

		Program Title	1976 Rate
1.	99.1901	Life, Physical Scientists	.0026
2.	99.2200	Other Social Scientists	.0037
3.	16.01.09	Electromechanical Tech	.0095
4.	14.04.96	Community Planners	.0098
5.	16.06.01	Commercial Pilot	.0106
6.	99.0914	Engineers, Metallurgical	.0106
7.	99.0918	Engineers, Mining	.0109
8.	99.0902	Engineers, Aerospace	.0114
9.	16.01.96	Biomedical Equipment	.0121
10.	99.05.03	Actuaries	.0121

Based on results of Job Opportunities Forecast for 1976.

HIGHLIGHTS BY EDUCATIONAL PROGRAM

Educational Programs Ranked by Expansion Opportunities

The Top Ten Programs			Expansion Opportunities	Total Demand
1.	04.08.00	Marketing and Sales	2,921	5,902
2.	14.07.00	Secretarial Science	2,294	4,018
3.	14.01.01	Accounting	1,403	3,352
4.	04.02.00	Fashion Merchandising	1,371	2,475
5.	17.29.04	Waiter/Waitress	1,367	2,429
6.	17.29.02	Commercial Cooking and	1,337	2,497
7.	17.23.02	Machine Shop	1,123	1,945
8.	01.02.00	Agricultural Business	1,016	2,794
9.	17.03.99	Commercial Driving	910	1,663
10.	17.12.00	Diesel and Heavy Equipment Mechanics	854	1,324

The Next Ten Programs			Expansion Opportunities	Total Demand
11.	14.08.05	Business Management	824	1,583
12.	14.02.00	Data Processing	766	1,203
13.	14.05.04	Stock and Inventory Clerk	730	1,209
14.	17.10.01	Carpentry	670	1,341
15.	17.11.00	Custodial Services	598	1,577
16.	14.09.00	Typist (and Related Occupations)	597	1,216
17.	07.03.02	Practical Nursing	595	1,154
18.	04.06.00	Cashier/Checker	561	1,090
19.	04.99.00	Purchasing Management	552	1,039
20.	17.23.06	Welding	542	819

Based on average annual forecast for fiscal years 1977-1980.

HIGHLIGHTS BY EDUCATIONAL PROGRAM

Educational Programs Ranked by Total Demand

The Top Ten Programs			Total Demand
1.	04.08.00	Marketing and Sales	5,902
2.	14.07.00	Secretarial Science	4,018
3.	14.01.01	Accounting	3,352
4.	01.02.00	Agricultural Business	2,794
5.	17.29.02	Commercial Cooking and	2,497
6.	04.02.00	Fashion Merchandising	2,475
7.	17.29.04	Waiter/Waitress	2,429
8.	17.23.02	Machine Shop	1,945
9.	01.01.00	Agricultural Production	1,723
10.	17.03.99	Commercial Driving	1,663

The Next Ten Programs			Total Demand
11.	14.08.05	Business Management	1,583
12.	17.11.00	Custodial Services	1,577
13.	16.05.98	Executive Housekeeping Technology	1,458
14.	17.10.01	Carpentry	1,341
15.	17.12.00	Diesel and Heavy Equipment Mechanics	1,324
16.	14.09.00	Typist (and Related Occupations)	1,216
17.	14.05.04	Stock and Inventory Clerk	1,209
18.	14.02.00	Data Processing	1,203
19.	07.03.02	Practical Nursing	1,154
20.	04.06.00	Cashier/Checker	1,090

Based on average annual forecast for fiscal years 1977-1980.

THE JOB OPPORTUNITIES FORECAST

Forecasts of total job opportunities (demand), job opportunities created by economic growth (expansion), and job opportunities created by labor force separations (replacement) are provided for occupational skills related to 251 educational programs in Washington State. The forecast is broken into five sections:

1. Vocational Education Programs (currently offered)
2. Potential/Emerging Vocational Education Programs
3. Professional Education Programs (a limited selection)
4. Forecast Summary (including other occupations)
5. References to Other Educational Programs

In addition to job opportunities, employment levels and replacement rates are provided for each program. The forecast covers a period of twelve fiscal years, from 1974 to 1985. The first three years of this period use actual labor force reports within the modeling procedure. The last nine years are based upon the Long Term Economic Forecast for Washington State.

PART IV

WASHINGTON STATE JOB OPPORTUNITIES FORECAST - THIRD EDITION

SECTION 1: VOCATIONAL EDUCATION PROGRAMS
FIELD 01.00.00 AGRICULTURE OCCUPATIONS

JOF TABLE 1

JUNE, 1977

OE CODE	PROGRAM TITLE/ REFERENCE	DEMAND/ EMPLOYMENT	FISCAL YEARS 1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
01.01.00	Agricultural Production	Total Demand	1,776	1,721	1,554	1,678	1,671	1,718	1,823	1,757	1,746	1,739	1,787	1,724
		Expansion	460	340	118	183	120	110	156	86	71	61	104	39
		Replacement	1,316	1,381	1,436	1,495	1,551	1,608	1,667	1,671	1,675	1,678	1,683	1,685
		Employment	31,855	32,195	32,313	32,496	32,616	32,726	32,882	32,968	33,039	33,100	33,204	33,243
		Repl. Rate	.0413	.0429	.0444	.0460	.0476	.0491	.0507	.0507	.0507	.0507	.0507	.0507
01.02.00	Agricultural Business	Total Demand	2,708	2,501	1,985	2,621	2,772	2,848	2,936	2,892	2,823	2,743	2,663	2,557
		Expansion	1,250	971	401	963	1,035	1,031	1,036	956	854	746	641	515
		Replacement	1,468	1,530	1,584	1,658	1,737	1,817	1,900	1,936	1,969	1,997	2,022	2,042
		Employment	44,305	45,276	45,677	46,640	47,675	48,706	49,742	50,698	51,552	52,298	52,939	53,454
		Repl. Rate	.0329	.0338	.0347	.0356	.0364	.0373	.0382	.0382	.0382	.0382	.0382	.0382
01.02.98	Animal Technology	Total Demand	197	243	192	219	236	241	252	248	246	253	258	265
		Expansion	141	180	125	146	157	156	160	152	145	148	149	151
		Replacement	56	63	67	73	79	85	92	96	101	105	109	114
		Employment	2,202	2,382	2,507	2,653	2,810	2,966	3,126	3,278	3,423	3,571	3,720	3,871
		Repl. Rate	.0256	.0263	.0269	.0275	.0282	.0288	.0294	.0294	.0294	.0294	.0294	.0294
01.02.99	Farrier	Total Demand	49	52	38	47	51	53	56	55	54	55	55	54
		Expansion	33	35	20	28	30	31	32	30	28	28	28	26
		Replacement	16	17	18	19	21	22	24	25	26	27	27	28
		Employment	623	658	678	706	736	767	799	829	857	885	913	939
		Repl. Rate	.0250	.0258	.0266	.0275	.0283	.0291	.0300	.0300	.0300	.0300	.0300	.0300
01.03.01	Agricultural Mechanics	Total Demand	464	464	412	459	474	489	514	504	501	501	511	505
		Expansion	158	142	76	108	107	106	114	99	91	87	92	81
		Replacement	306	322	336	351	367	383	400	405	410	414	419	424
		Employment	6,786	6,928	7,004	7,112	7,219	7,325	7,439	7,538	7,629	7,716	7,808	7,889
		Repl. Rate	.0450	.0465	.0479	.0494	.0508	.0523	.0537	.0537	.0537	.0537	.0537	.0537
01.03.04	Irrigation Technology	Total Demand	48	49	34	53	60	58	59	61	58	54	50	50
		Expansion	29	29	13	30	36	32	32	33	29	25	20	19
		Replacement	19	20	21	23	24	26	27	28	29	29	30	31
		Employment	831	860	873	903	939	971	1,003	1,036	1,605	1,090	1,110	1,129
		Repl. Rate	.0229	.0236	.0243	.0250	.0257	.0264	.0271	.0271	.0271	.0271	.0271	.0271

Note: Before using values presented in this table see Part III, Section 1, Interpreting the Forecast Results.

JOF TABLE 1

WASHINGTON STATE JOB OPPORTUNITIES FORECAST - THIRD EDITION

SECTION 1: VOCATIONAL EDUCATION PROGRAMS
FIELD 01.00.00 AGRICULTURE OCCUPATIONS

JOF TABLE 2

JUNE, 1977

OE CODE	PROGRAM TITLE/ REFERENCE	DEMAND/ EMPLOYMENT	FISCAL YEARS 1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
01.05.00	Environmental Horticulture	Total Demand	370	481	330	410	454	446	455	437	412	408	403	399
		Expansion	100	190	25	88	113	87	78	57	30	25	19	14
		Replacement	270	291	305	322	341	359	377	380	382	383	384	385
		Employment	6,135	6,325	6,350	6,438	6,551	6,638	6,716	6,773	6,803	6,828	6,847	6,861
		Repl. Rate	.0440	.0460	.0481	.0501	.0521	.0541	.0561	.0561	.0561	.0561	.0561	.0561
01.06.00	Natural Resources	Total Demand	229	285	197	248	268	264	267	254	237	235	231	226
		Expansion	66	111	15	56	66	52	46	31	14	11	7	2
		Replacement	163	174	182	192	202	212	221	223	223	224	224	224
		Employment	4,063	4,174	4,189	4,245	4,311	4,363	4,409	4,440	4,454	4,466	4,472	4,474
		Repl. Rate	.0401	.0418	.0435	.0451	.0468	.0485	.0502	.0502	.0502	.0502	.0502	.0502
01.06.02	Recreation Technology	Total Demand	37	43	28	37	41	38	40	37	34	34	33	34
		Expansion	22	28	12	20	23	20	21	17	14	14	13	13
		Replacement	15	15	16	17	18	18	19	20	20	20	20	21
		Employment	778	806	818	838	861	881	902	919	933	947	960	973
		Repl. Rate	.0187	.0191	.0196	.0200	.0205	.0209	.0213	.0213	.0213	.0213	.0213	.0213
01.06.04	Fish and Game Management	Total Demand	82	102	66	82	89	86	86	80	74	75	74	74
		Expansion	39	57	19	34	39	34	32	26	19	19	18	17
		Replacement	43	45	47	48	50	52	54	54	55	56	56	57
		Employment	1,538	1,595	1,614	1,648	1,687	1,721	1,753	1,779	1,798	1,817	1,835	1,852
		Repl. Rate	.0280	.0284	.0289	.0293	.0297	.0302	.0306	.0306	.0306	.0306	.0306	.0306
01.07.00	Industrial Forestry	Total Demand	156	-714	-35	415	263	165	144	169	143	100	57	-15
		Expansion	-64	-921	-242	198	40	-62	-86	-60	-84	-124	-163	-230
		Replacement	220	207	207	217	223	227	230	229	227	224	220	215
		Employment	11,161	10,240	9,998	10,196	10,236	10,174	10,088	10,028	9,944	9,820	9,657	9,427
		Repl. Rate	.0197	.0202	.0208	.0213	.0218	.0223	.0228	.0228	.0228	.0228	.0228	.0228
	Field Total	Total Demand	6,116	5,227	4,801	6,269	6,379	6,406	6,632	6,494	6,328	6,197	6,122	5,873
		Expansion	2,234	1,162	582	1,854	1,766	1,597	1,621	1,427	1,211	1,040	928	647
		Replacement	3,882	4,065	4,219	4,415	4,613	4,809	5,011	5,067	5,117	5,157	5,194	5,226
		Employment	110,277	111,439	112,021	113,875	115,641	117,238	118,859	120,286	121,497	122,537	123,465	124,112
		Repl. Rate	.0352	.0365	.0377	.0388	.0399	.0410	.0422	.0422	.0422	.0422	.0422	.0422

Note: Before using values presented in this table see Part III, Section 1, Interpreting the Forecast Results.

JOF TABLE 3

SECTION 1: VOCATIONAL EDUCATION PROGRAMS
FIELD 04.00.00 DISTRIBUTIVE EDUCATION OCCUPATIONS

JUNE, 1977

OE CODE	PROGRAM TITLE/ REFERENCE	DEMAND/ EMPLOYMENT	FISCAL YEARS 1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
04.01.00	Display Designing	Total Demand	97	110	79	104	114	119	125	123	121	117	114	116
		Expansion	60	70	38	60	68	70	73	69	65	59	55	55
		Replacement	37	40	41	44	46	49	52	54	56	58	59	61
		Employment	1,418	1,488	1,526	1,586	1,654	1,724	1,797	1,866	1,931	1,990	2,045	2,100
		Repl. Rate	.0262	.0266	.0271	.0275	.0280	.0285	.0289	.0289	.0289	.0289	.0289	.0289
04.02.00	Fashion Merchandising	Total Demand	2,110	2,340	1,723	2,206	2,456	2,570	2,668	2,645	2,574	2,524	2,485	2,536
		Expansion	1,250	1,422	766	1,196	1,385	1,435	1,467	1,396	1,281	1,191	1,114	1,126
		Replacement	860	918	957	1,010	1,071	1,135	1,201	1,249	1,293	1,333	1,371	1,410
		Employment	27,574	28,996	29,762	30,958	32,343	33,778	35,245	36,641	37,922	39,113	40,227	41,353
		Repl. Rate	.0312	.0317	.0322	.0326	.0331	.0336	.0341	.0341	.0341	.0341	.0341	.0341
04.03.00	Parts Merchandising	Total Demand	558	524	311	494	599	617	631	618	591	579	557	560
		Expansion	349	303	83	254	344	347	345	322	286	265	236	231
		Replacement	209	221	228	240	255	270	286	296	305	314	321	329
		Employment	7,329	7,632	7,715	7,969	8,313	8,660	9,005	9,327	9,613	9,878	10,114	10,345
		Repl. Rate	.0285	.0290	.0296	.0301	.0307	.0312	.0318	.0318	.0318	.0318	.0318	.0318
04.04.00	Financial Management	Total Demand	519	486	425	551	591	530	561	574	555	542	528	521
		Expansion	286	242	173	287	313	241	260	265	239	220	200	188
		Replacement	233	244	252	264	278	289	301	309	316	322	328	333
		Employment	8,943	9,185	9,358	9,645	9,958	10,199	10,459	10,724	10,963	11,183	11,383	11,571
		Repl. Rate	.0261	.0265	.0270	.0274	.0279	.0283	.0288	.0288	.0288	.0288	.0288	.0288
04.06.00	Cashier/Checker (Includes all Retail Industries)	Total Demand	873	1,096	821	976	1,039	1,148	1,198	1,161	1,088	1,013	958	992
		Expansion	435	635	345	481	523	608	633	579	492	404	339	363
		Replacement	438	461	476	495	516	540	565	582	596	609	619	629
		Employment	15,743	16,378	16,723	17,204	17,727	18,335	18,968	19,547	20,039	20,443	20,782	21,145
		Repl. Rate	.0278	.0281	.0285	.0288	.0291	.0294	.0298	.0298	.0298	.0298	.0298	.0298
04.06.98	Supermarket Management	Total Demand	524	618	438	548	599	641	660	634	584	537	500	510
		Expansion	236	313	122	218	253	278	280	246	189	138	97	104
		Replacement	288	305	316	330	346	363	380	388	395	399	403	406
		Employment	9,705	10,018	10,140	10,358	10,611	10,889	11,169	11,415	11,604	11,742	11,839	11,943
		Repl. Rate	.0297	.0304	.0311	.0319	.0326	.0333	.0340	.0340	.0340	.0340	.0340	.0340

Note: Before using values presented in this table see Part III, Section 1, Interpreting the Forecast Results.

WASHINGTON STATE JOB OPPORTUNITIES FORECAST - THIRD EDITION

JOF TABLE 4

SECTION 1: VOCATIONAL EDUCATION PROGRAMS
FIELD 04.00.00 DISTRIBUTIVE EDUCATION OCCUPATIONS

JUNE, 1977

OE CODE	PROGRAM TITLE/ REFERENCE	DEMAND/ EMPLOYMENT	FISCAL YEARS 1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
04.07.00	Club and Tavern Management	Total Demand	425	535	425	497	531	586	619	611	591	569	555	579
		Expansion	232	328	208	267	287	326	343	324	294	263	241	256
		Replacement	193	207	217	230	244	260	276	287	297	306	314	323
		Employment	6,393	6,721	6,929	7,196	7,483	7,809	8,152	8,476	8,770	9,033	9,274	9,530
		Repl. Rate	.0301	.0307	.0314	.0320	.0326	.0332	.0339	.0339	.0339	.0339	.0339	.0339
04.08.00	Marketing and Sales	Total Demand	5,127	5,271	3,720	5,308	5,944	6,074	6,282	6,221	6,024	5,711	5,404	5,368
		Expansion	2,758	2,763	1,120	2,569	3,046	3,014	3,055	2,895	2,608	2,219	1,849	1,753
		Replacement	2,369	2,508	2,600	2,739	2,898	3,060	3,227	3,326	3,416	3,492	3,555	3,615
		Employment	78,790	81,553	82,673	85,242	88,288	91,302	94,357	97,252	99,860	102,079	103,928	105,681
		Repl. Rate	.0301	.0308	.0314	.0321	.0328	.0335	.0342	.0342	.0342	.0342	.0342	.0342
04.09.00	Forest Products Distribution	Total Demand	151	157	139	175	185	198	207	207	201	194	188	192
		Expansion	87	89	67	99	104	112	115	112	102	92	83	85
		Replacement	64	68	72	76	81	86	92	95	99	102	105	107
		Employment	2,158	2,247	2,314	2,413	2,517	2,629	2,744	2,856	2,958	3,050	3,133	3,218
		Repl. Rate	.0298	.0304	.0310	.0316	0322	.0328	.0334	.0334	.0334	.0334	.0334	.0334
04.10.00	Interior Merchandising	Total Demand	720	793	590	752	833	882	914	900	871	834	803	817
		Expansion	394	446	229	372	432	458	466	437	394	345	303	307
		Replacement	326	347	361	380	401	424	448	463	477	489	500	510
		Employment	10,412	10,858	11,087	11,459	11,891	12,349	12,815	13,252	13,646	13,991	14,294	14,601
		Repl. Rate	.0313	.0319	.0325	.0331	.0337	.0344	.0350	.0350	.0350	.0350	.0350	.0350
04.11.00	Hotel, Motel, Restaurant Management	Total Demand	528	606	474	568	616	635	661	650	625	612	601	610
		Expansion	226	285	141	219	249	249	256	234	200	179	160	162
		Replacement	302	321	333	349	367	386	405	416	425	433	441	448
		Employment	7,306	7,591	7,732	7,951	8,200	8,449	8,705	8,939	9,139	9,318	9,478	9,640
		Repl. Rate	.0414	.0422	.0431	.0439	.0448	.0457	.0465	.0465	.0465	.0465	.0465	.0465
04.13.00	Insurance Management	Total Demand	235	187	196	248	258	220	236	244	232	228	221	217
		Expansion	123	71	75	120	124	80	90	96	82	75	67	61
		Replacement	112	116	121	128	134	140	146	148	150	153	154	156
		Employment	4,701	4,772	4,847	4,967	5,091	5,171	5,261	5,357	5,439	5,514	5,581	5,642
		Repl. Rate	.0237	.0244	.0250	.0257	.0264	.0270	.0277	.0277	.0277	.0277	.0277	.0277

Note: Before using values presented in this table see Part III, Section 1, Interpreting the Forecast Results.

WASHINGTON STATE JOB OPPORTUNITIES FORECAST - THIRD EDITION

JOF TABLE 5

SECTION 1: VOCATIONAL EDUCATION PROGRAMS
FIELD 04.00.00 DISTRIBUTIVE EDUCATION OCCUPATIONS

JUNE, 1977

OE CODE	PROGRAM TITLE/ REFERENCE	DEMAND/ EMPLOYMENT	FISCAL YEARS 1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
04.16.00	Service Station Operation and Management	Total Demand	316	422	223	333	353	398	411	372	317	269	232	235
		Expansion	203	302	99	204	218	257	263	221	164	115	77	79
		Replacement	113	120	124	129	135	141	148	151	153	154	155	156
		Employment	10,678	10,980	11,079	11,283	11,501	11,758	12,021	12,242	12,406	12,521	12,598	12,677
		Repl. Rate	.0106	.0109	.0112	.0115	.0117	.0120	.0123	.0123	.0123	.0123	.0123	.0123
04.17.00	Real Estate	Total Demand	943	835	857	1,026	1,083	982	1,049	1,076	1,047	1,032	1,019	1,005
		Expansion	339	202	195	329	348	215	248	262	221	196	174	152
		Replacement	604	633	662	697	735	767	801	814	826	836	845	853
		Employment	13,862	14,064	14,259	14,588	14,936	15,151	15,399	15,661	15,882	16,078	16,252	16,404
		Repl. Rate	.0436	.0450	.0464	.0478	.0492	.0506	.0520	.0520	.0520	.0520	.0520	.0520
04.18.00	Commercial Recreation and Tourism	Total Demand	128	132	76	140	141	138	140	130	121	120	124	119
		Expansion	64	65	8	69	66	60	59	48	38	36	39	33
		Replacement	64	67	68	71	75	78	81	82	83	84	85	86
		Employment	2,668	2,733	2,741	2,810	2,876	2,936	2,995	3,043	3,081	3,117	3,156	3,189
		Repl. Rate	.0239	.0244	.0249	.0254	.0260	.0265	.0270	.0270	.0270	.0270	.0270	.0270
04.19.00	Transportation	Total Demand	627	460	270	592	576	593	594	565	521	488	490	447
		Expansion	362	185	-11	298	269	274	262	227	179	143	142	97
		Replacement	265	275	281	294	307	319	332	338	342	345	348	350
		Employment	13,259	13,444	13,433	13,731	14,000	14,274	14,536	14,763	14,942	15,085	15,227	15,324
		Repl. Rate	.0200	.0204	.0209	.0214	.0219	.0224	.0229	.0229	.0229	.0229	.0229	.0229
04.19.01	Motor Freight	Total Demand	169	-70	45	205	180	168	159	163	148	136	121	93
		Expansion	79	-159	-45	111	83	68	56	59	43	30	15	-13
		Replacement	90	89	90	94	97	100	103	104	105	106	106	106
		Employment	5,114	4,955	4,910	5,021	5,104	5,172	5,228	5,287	5,330	5,360	5,375	5,362
		Repl. Rate	.0176	.0180	.0183	.0186	.0190	.0193	.0197	.0197	.0197	.0197	.0197	.0197
04.19.02	Air Cargo	Total Demand	84	-35	22	103	89	84	79	81	75	68	60	47
		Expansion	39	-79	-23	56	41	34	28	29	22	15	7	-6
		Replacement	45	44	45	47	48	50	51	52	53	53	53	53
		Employment	2,557	2,478	2,455	2,511	2,552	2,586	2,614	2,643	2,665	2,680	2,687	2,681
		Repl. Rate	.0176	.0180	.0183	.0186	.0190	.0193	.0197	.0197	.0197	.0197	.0197	.0197

Note: Before using values presented in this table see Part III, Section 1, Interpreting the Forecast Results.

WASHINGTON STATE JOB OPPORTUNITIES FORECAST - THIRD EDITION

JOF TABLE 6

SECTION 1: VOCATIONAL EDUCATION PROGRAMS
FIELD 04.00.00 DISTRIBUTIVE EDUCATION OCCUPATIONS

JUNE, 1977

OE CODE	PROGRAM TITLE/ REFERENCE	DEMAND/ EMPLOYMENT	FISCAL YEARS 1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
04.19.03	Transportation Agent	Total Demand	169	-70	45	205	180	168	159	163	148	136	121	93
		Expansion	79	-159	-45	111	83	68	56	59	43	30	15	-13
		Replacement	90	89	90	94	97	100	103	104	105	106	106	106
		Employment	5,114	4,955	4,910	5,021	5,104	5,172	5,228	5,287	5,330	5,360	5,375	5,362
		Repl. Rate	.0176	.0180	.0183	.0186	.0190	.0193	.0197	.0197	.0197	.0197	.0197	.0197
04.19.98	Flight Attendant	Total Demand	110	63	45	124	111	115	118	115	110	109	117	107
		Expansion	56	8	-10	65	50	51	51	46	40	37	44	32
		Replacement	54	55	55	59	61	64	67	69	70	72	73	75
		Employment	1,633	1,641	1,631	1,696	1,746	1,797	1,848	1,894	1,934	1,971	2,015	2,047
		Repl. Rate	.0328	.0334	.0340	.0346	.0352	.0358	.0364	.0364	.0364	.0364	.0364	.0364
04.20.00	Service Representative	Total Demand	404	396	169	351	432	442	452	444	413	407	402	393
		Expansion	270	254	24	200	272	274	275	261	225	214	205	191
		Replacement	134	142	145	151	160	168	177	183	188	193	197	202
		Employment	6,535	6,789	6,813	7,013	7,285	7,559	7,834	8,095	8,320	8,534	8,739	8,930
		Repl. Rate	.0206	.0209	.0212	.0216	.0219	.0223	.0226	.0226	.0226	.0226	.0226	.0226
04.99.00	Purchasing Management	Total Demand	976	866	531	900	1,069	1,079	1,107	1,101	1,078	1,037	983	946
		Expansion	592	459	111	457	597	578	577	553	513	457	390	342
		Replacement	384	407	420	443	472	501	530	548	565	580	593	604
		Employment	13,376	13,835	13,946	14,403	15,000	15,578	16,155	16,708	17,221	17,678	18,068	18,410
		Repl. Rate	.0287	.0294	.0301	.0308	.0315	.0321	.0328	.0328	.0328	.0328	.0328	.0328
	Field Total	Total Demand	15,793	15,722	11,624	16,406	17,979	18,387	19,030	18,798	18,035	17,262	16,583	16,503
		Expansion	8,519	8,045	3,670	8,042	9,155	9,097	9,258	8,740	7,720	6,723	5,852	5,585
		Replacement	7,274	7,677	7,954	8,364	8,824	9,290	9,772	10,058	10,315	10,539	10,731	10,918
		Employment	255,268	263,313	266,983	275,025	284,180	293,277	302,535	311,275	318,995	325,718	331,570	337,155
		Repl. Rate	.0285	.0292	.0298	.0304	.0311	.0317	.0323	.0323	.0323	.0323	.0323	.0323

Note: Before using values presented in this table see Part III, Section 1, Interpreting the Forecast Results.

WASHINGTON STATE JOB OPPORTUNITIES FORECAST - THIRD EDITION

JOF TABLE 7

SECTION 1: VOCATIONAL EDUCATION PROGRAMS
FIELD 07.00.00 HEALTH OCCUPATIONS

JUNE, 1977

OE CODE	PROGRAM TITLE/ REFERENCE	DEMAND/ EMPLOYMENT	FISCAL YEARS 1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
07.01.01	Dental Assisting	Total Demand	468	590	449	520	564	560	577	562	555	572	580	597
		Expansion	290	397	246	305	335	318	322	297	280	287	285	292
		Replacement	178	193	203	215	229	242	255	265	275	285	295	305
		Employment	5,552	5,949	6,195	6,500	6,835	7,153	7,475	7,772	8,052	8,339	8,624	8,916
		Repl. Rate	.0320	.0324	.0327	.0331	.0334	.0338	.0342	.0342	.0342	.0342	.0342	.0342
07.01.02	Dental Hygiene	Total Demand	89	105	97	108	118	122	129	130	132	137	143	148
		Expansion	76	89	79	87	94	95	99	97	97	99	102	104
		Replacement	13	16	18	21	24	27	30	33	35	38	41	44
		Employment	478	567	646	733	827	922	1,021	1,118	1,215	1,314	1,416	1,520
		Repl. Rate	.0272	.0275	.0279	.0282	.0285	.0289	.0292	.0292	.0292	.0292	.0292	.0292
07.01.03	Dental Laboratory Technology	Total Demand	42	54	34	42	45	44	43	40	38	38	37	37
		Expansion	22	33	12	19	20	18	16	13	10	10	9	9
		Replacement	20	21	22	23	25	26	27	27	28	28	28	28
		Employment	802	835	847	866	886	904	920	933	943	953	962	971
		Repl. Rate	.0246	.0254	.0261	.0269	.0277	.0284	.0292	.0292	.0292	.0292	.0292	.0292
07.02.00	Medical Laboratory Technology	Total Demand	59	75	53	63	69	66	68	65	63	65	65	66
		Expansion	40	54	31	40	45	41	42	38	35	36	35	36
		Replacement	19	21	22	23	24	25	26	27	28	29	30	30
		Employment	864	918	949	989	1,034	1,075	1,117	1,155	1,190	1,226	1,261	1,297
		Repl. Rate	.0223	.0225	.0227	.0229	.0231	.0233	.0235	.0235	.0235	.0235	.0235	.0235
07.02.03	Laboratory Technology	Total Demand	12	15	11	14	15	14	16	15	14	15	16	17
		Expansion	9	12	8	10	11	10	11	10	9	10	10	11
		Replacement	3	3	3	4	4	4	5	5	5	5	6	6
		Employment	143	155	163	173	184	194	205	215	224	234	244	255
		Repl. Rate	.0207	.0211	.0215	.0218	.0222	.0226	.0230	.0230	.0230	.0230	.0230	.0230
07.03.01	Registered/ Associate Degree Nursing	Total Demand	842	1,078	715	844	909	871	871	812	772	778	768	774
		Expansion	346	559	186	302	351	299	285	218	171	171	155	155
		Replacement	496	519	529	542	558	572	586	594	601	607	613	619
		Employment	13,187	13,746	13,932	14,234	14,585	14,884	15,169	15,387	15,558	15,729	15,884	16,039
		Repl. Rate	.0376	.0378	.0379	.0381	.0383	.0384	.0386	.0386	.0386	.0386	.0386	.0386

Note: Before using values presented in this table see Part III, Section 1, Interpreting the Forecast Results.

WASHINGTON STATE JOB OPPORTUNITIES FORECAST - THIRD EDITION

JOF TABLE 8

SECTION 1: VOCATIONAL EDUCATION PROGRAMS
FIELD 07.00.00 HEALTH OCCUPATIONS

JUNE, 1977

OE CODE	PROGRAM TITLE/ REFERENCE	DEMAND/ EMPLOYMENT	FISCAL YEARS 1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
07.03.02	Practical Nursing	Total Demand	968	1,191	949	1,079	1,167	1,168	1,203	1,185	1,180	1,216	1,238	1,275
		Expansion	536	726	461	564	622	594	600	557	528	540	538	550
		Replacement	432	465	488	515	545	574	603	628	652	676	700	725
		Employment	9,892	10,618	11,079	11,643	12,265	12,859	13,459	14,016	14,544	15,084	15,622	16,172
		Repl. Rate	.0436	.0438	.0440	.0442	.0444	.0446	.0448	.0448	.0448	.0448	.0448	.0448
07.03.03	Nurses Aide/ Nursing Assisting	Total Demand	663	833	622	721	779	770	789	765	751	771	780	800
		Expansion	377	527	303	386	427	401	403	366	340	347	344	351
		Replacement	286	306	319	33	352	369	386	399	411	424	436	449
		Employment	8,146	8,673	8,976	9,362	9,789	10,190	10,593	10,959	11,299	11,646	11,990	12,341
		Repl. Rate	.0351	.0353	.0355	.0357	.0360	.0362	.0364	.0364	.0364	.0364	.0364	.0364
07.03.05	Surgical Technology	Total Demand	62	77	55	69	74	74	77	75	75	76	79	80
		Expansion	47	61	38	50	54	52	53	50	49	49	51	51
		Replacement	15	16	17	19	20	22	24	25	26	27	28	29
		Employment	715	776	814	864	918	970	1,023	1,073	1,122	1,171	1,222	1,273
		Repl. Rate	.0207	.0211	.0214	.0218	.0222	.0226	.0230	.0230	.0230	.0230	.0230	.0230
07.03.07	Home Health Aide	Total Demand	174	234	92	112	108	72	51	15	-14	-31	-52	-71
		Expansion	-57	5	-129	-103	-100	-128	-141	-169	-189	-196	-207	-215
		Replacement	231	229	221	215	208	200	192	184	175	165	155	144
		Employment	4,543	4,548	4,419	4,316	4,216	4,088	3,947	3,778	3,589	3,393	3,186	2,971
		Repl. Rate	.0508	.0504	.0501	.0497	.0494	.0490	.0486	.0486	.0486	.0486	.0486	.0486
07.03.99	Gerontology Aide	Total Demand	489	612	447	513	549	535	539	519	506	517	520	530
		Expansion	230	340	170	228	256	234	231	203	182	186	181	184
		Replacement	259	272	277	285	293	301	308	316	324	331	339	346
		Employment	6,135	6,475	6,645	6,873	7,129	7,363	7,594	7,797	7,979	8,165	8,346	8,530
		Repl. Rate	.0423	.0420	.0417	.0414	.0411	.0408	.0406	.0406	.0406	.0406	.0406	.0406
07.04.01	Occupational Therapy Assisting	Total Demand	15	21	12	16	16	17	16	15	13	13	13	14
		Expansion	9	15	5	9	9	9	8	7	5	5	5	5
		Replacement	6	6	7	7	7	8	8	8	8	8	8	9
		Employment	345	360	365	374	383	392	400	407	412	417	422	427
		Repl. Rate	.0175	.0179	.0184	.0188	.0192	.0197	.0201	.0201	.0201	.0201	.0201	.0201

Note: Before using values presented in this table see Part III, Section 1, Interpreting the Forecast Results.

JOF TABLE 8

WASHINGTON STATE JOB OPPORTUNITIES FORECAST - THIRD EDITION

JOF TABLE 9

SECTION 1: VOCATIONAL EDUCATION PROGRAMS
FIELD 07.00.00 HEALTH OCCUPATIONS

JUNE, 1977

OE CODE	PROGRAM TITLE/ REFERENCE	DEMAND/ EMPLOYMENT	FISCAL YEARS 1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
07.04.02	Physical Therapy Assisting	Total Demand	34	42	33	38	41	42	43	42	42	43	44	45
		Expansion	24	31	22	26	28	28	28	26	26	26	26	27
		Replacement	10	11	11	12	13	14	15	16	16	17	18	18
		Employment	371	402	424	450	478	506	534	560	586	612	638	665
		Repl. Rate	.0266	.0268	.0270	.0272	.0274	.0275	.0277	.0277	.0277	.0277	.0277	.0277
07.04.99	Sports Training Assisting	Total Demand	25	36	21	25	28	27	26	24	23	22	22	22
		Expansion	12	22	7	11	13	12	10	8	7	6	6	5
		Replacement	13	14	14	14	15	15	16	16	16	16	16	17
		Employment	508	530	537	548	561	573	583	591	598	604	610	615
		Repl. Rate	.0257	.0259	.0261	.0263	.0266	.0268	.0270	.0270	.0270	.0270	.0270	.0270
07.05.01	Radiologic Technology	Total Demand	61	83	49	61	66	63	63	57	54	53	52	53
		Expansion	30	51	16	27	31	26	25	19	15	14	13	13
		Replacement	31	32	33	34	35	37	38	38	39	39	39	40
		Employment	1,213	1,264	1,280	1,307	1,338	1,364	1,389	1,408	1,423	1,437	1,450	1,463
		Repl. Rate	.0252	.0255	.0258	.0262	.0265	.0268	.0271	.0271	.0271	.0271	.0271	.0271
07.05.03	Nuclear Medical Technology	Total Demand	32	41	25	30	34	33	32	30	28	29	27	29
		Expansion	17	25	9	14	17	15	14	11	9	10	8	9
		Replacement	15	16	16	16	17	18	18	19	19	19	19	20
		Employment	562	587	596	610	627	642	656	667	676	686	694	703
		Repl. Rate	.0262	.0264	.0267	.0270	.0273	.0275	.0278	.0278	.0278	.0278	.0278	.0278
07.06.00	Optometric Technology	Total Demand	59	59	54	62	65	70	72	74	74	71	74	75
		Expansion	46	45	39	45	47	50	50	51	50	46	48	48
		Replacement	13	14	15	17	18	20	22	23	24	25	26	27
		Employment	630	675	714	759	806	856	906	957	1,007	1,053	1,101	1,149
		Repl. Rate	.0206	.0211	.0217	.0222	.0227	.0233	.0238	.0238	.0238	.0238	.0238	.0238
07.08.01	Mental Health Technology	Total Demand	13	18	12	16	16	17	16	16	14	16	15	16
		Expansion	4	8	2	5	5	5	4	4	2	3	2	3
		Replacement	9	10	10	11	11	12	12	12	12	13	13	13
		Employment	205	213	215	220	225	230	234	238	240	243	245	248
		Repl. Rate	.0454	.0464	.0474	.0485	.0495	.0506	.0516	.0516	.0516	.0516	.0516	.0516

Note: Before using values presented in this table see Part III, Section 1, Interpreting the Forecast Results.

WASHINGTON STATE JOB OPPORTUNITIES FORECAST - THIRD EDITION

JOF TABLE 10

SECTION 1: VOCATIONAL EDUCATION PROGRAMS
FIELD 07.00.00 HEALTH OCCUPATIONS

JUNE, 1977

OE CODE	PROGRAM TITLE/ REFERENCE	DEMAND/ EMPLOYMENT	FISCAL YEARS 1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
07.08.02	Mental Retardation Technology	Total Demand	175	220	170	196	212	213	220	214	212	216	219	226
		Expansion	91	129	75	95	105	100	101	91	85	86	85	88
		Replacement	84	91	95	101	107	113	119	123	127	130	134	138
		Employment	2,019	2,148	2,223	2,318	2,423	2,523	2,624	2,715	2,800	2,886	2,971	3,059
		Repl. Rate	.0415	.0421	.0428	.0434	.0440	.0446	.0452	.0452	.0452	.0452	.0452	.0452
07.09.03	Respiratory Therapy	Total Demand	26	34	21	26	29	27	28	25	24	24	24	24
		Expansion	14	21	8	12	15	12	13	10	8	8	8	8
		Replacement	12	13	13	14	14	15	15	15	16	16	16	16
		Employment	453	474	482	494	509	521	534	544	552	560	568	576
		Repl. Rate	.0266	.0269	.0271	.0274	.0276	.0279	.0281	.0281	.0281	.0281	.0281	.0281
07.09.04	Medical Assisting	Total Demand	190	241	175	203	220	216	219	210	205	211	212	216
		Expansion	104	150	80	104	116	107	106	94	86	88	86	87
		Replacement	86	91	95	99	104	109	113	116	119	123	126	129
		Employment	2,579	2,729	2,809	2,913	3,029	3,136	3,242	3,336	3,422	3,510	3,596	3,683
		Repl. Rate	.0332	.0335	.0338	.0341	.0343	.0346	.0349	.0349	.0349	.0349	.0349	.0349
07.09.05	Central Service Technology	Total Demand	44	56	39	47	50	50	50	47	46	48	47	49
		Expansion	28	39	21	28	30	29	28	25	23	24	23	24
		Replacement	16	17	18	19	20	21	22	22	23	24	24	25
		Employment	660	699	720	748	778	807	835	860	883	907	930	954
		Repl. Rate	.0238	.0241	.0245	.0249	.0252	.0256	.0260	.0260	.0260	.0260	.0260	.0260
07.09.07	Medic I/ Medical Emergency Technology	Total Demand	37	49	33	40	42	42	42	40	38	39	38	40
		Expansion	20	31	15	21	22	21	21	18	16	16	15	16
		Replacement	17	18	18	19	20	21	21	22	22	23	23	24
		Employment	568	599	614	635	657	678	699	717	733	749	764	780
		Repl. Rate	.0293	.0295	.0297	.0299	.0301	.0303	.0305	.0305	.0305	.0305	.0305	.0305
07.09.08	Dietetic Technology	Total Demand	149	191	131	154	165	165	166	157	147	145	141	143
		Expansion	61	99	37	57	65	62	60	50	38	35	30	31
		Replacement	88	92	94	97	100	103	106	107	109	110	111	112
		Employment	2,501	2,600	2,637	2,694	2,759	2,821	2,881	2,931	,2969	3,004	3,034	3,065
		Repl. Rate	.0352	.0354	.0357	.0359	.0362	.0364	.0366	.0366	.0366	.0366	.0366	.0366

Note: Before using values presented in this table see Part III, Section 1, Interpreting the Forecast Results.

WASHINGTON STATE JOB OPPORTUNITIES FORECAST - THIRD EDITION

JOF TABLE 11

SECTION 1: VOCATIONAL EDUCATION PROGRAMS
FIELD 07.00.00 HEALTH OCCUPATIONS

JUNE, 1977

OE CODE	PROGRAM TITLE/ REFERENCE	DEMAND/ EMPLOYMENT	FISCAL YEARS 1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
07.09.11	Medical Photography	Total Demand	28	27	12	22	26	27	29	27	25	26	25	24
		Expansion	18	17	2	11	15	15	16	14	12	12	11	10
		Replacement	10	10	10	11	11	12	13	13	13	14	14	14
		Employment	351	368	370	381	396	411	427	441	453	465	476	486
		Repl. Rate	.0277	.0280	.0283	.0286	.0289	.0292	.0295	.0295	.0295	.0295	.0295	.0295
07.09.12	Medical Illustrating	Total Demand	49	64	47	54	60	60	61	60	57	60	60	62
		Expansion	34	47	29	35	39	38	37	35	32	34	33	34
		Replacement	15	17	18	19	21	22	24	25	25	26	27	28
		Employment	662	709	738	773	812	850	887	922	954	988	1,021	1,055
		Repl. Rate	.0229	.0235	.0241	.0248	.0254	.0260	.0266	.0266	.0266	.0266	.0266	.0266
07.99.01	Cardio-Pulmonary Technology	Total Demand	25	34	20	23	27	24	24	21	20	20	19	20
		Expansion	11	19	5	8	11	8	8	5	4	3	2	3
		Replacement	14	15	15	15	16	16	16	16	16	17	17	17
		Employment	515	534	539	547	558	566	574	579	583	586	588	591
		Repl. Rate	.0274	.0275	.0277	.0278	.0280	.0281	.0283	.0283	.0283	.0283	.0283	.0283
07.99.02	Nursing Home Administration	Total Demand	273	349	252	294	319	313	321	307	299	306	306	312
		Expansion	141	208	104	139	156	142	141	123	110	113	109	111
		Replacement	132	141	148	155	163	171	180	184	189	193	197	201
		Employment	3,762	3,970	4,074	4,213	4,369	4,511	4,652	4,775	4,885	4,998	5,107	5,218
		Repl. Rate	.0350	.0356	.0362	.0368	.0374	.0380	.0386	.0386	.0386	.0386	.0386	.0386
07.99.03	Pharmacy Assisting (Based on the Number of Pharmacists)	Total Demand	198	252	203	238	255	282	299	296	288	279	273	284
		Expansion	98	143	87	113	121	138	145	136	123	109	99	105
		Replacement	100	109	116	125	134	144	154	160	165	170	174	179
		Employment	2,883	3,026	3,113	3,226	3,347	3,485	3,630	3,766	3,889	3,998	4,097	4,202
		Repl. Rate	.0349	.0361	.0374	.0387	.0400	.0412	.0425	.0425	.0425	.0425	.0425	.0425
	Field Total	Total Demand	5,301	6,681	4,833	5,630	6,068	5,984	6,090	5,845	5,681	5,775	5,785	5,907
		Expansion	2,678	3,903	1,968	2,648	2,960	2,751	2,736	2,407	2,163	2,177	2,112	2,155
		Replacement	2,623	2,778	2,865	2,982	3,108	3,233	3,354	3,438	3,518	3,598	3,673	3,752
		Employment	71,244	75,147	77,115	79,763	82,723	85,474	88,210	90,617	92,780	94,957	97,069	99,224
		Repl. Rate	.0368	.0370	.0372	.0374	.0376	.0378	.0380	.0380	.0380	.0380	.0380	.0380

Note: Before using values presented in this table see Part III, Section 1, Interpreting the Forecast Results.

WASHINGTON STATE JOB OPPORTUNITIES FORECAST - THIRD EDITION

JOF TABLE 12

SECTION 1: VOCATIONAL EDUCATION PROGRAMS
FIELD 09.00.00 HOME AND FAMILY LIFE OCCUPATIONS

JUNE, 1977

OE CODE	PROGRAM TITLE/ REFERENCE	DEMAND/ EMPLOYMENT	FISCAL YEARS 1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
09.02.01	Care and Guidance of Children	Total Demand	535	714	380	454	474	410	373	307	252	229	197	173
		Expansion	29	199	-129	-52	-31	-91	-118	-180	-225	-238	-258	-270
		Replacement	506	515	509	506	505	501	495	487	477	467	455	443
		Employment	11,241	11,440	11,311	11,259	11,228	11,137	11,019	10,839	10,614	10,376	10,118	9,848
		Repl. Rate	.0450	.0450	.0450	.0450	.0450	.0450	.0450	.0450	.0450	.0450	.0450	.0450
09.02.96	Guidance Assisting	Total Demand	165	213	150	177	193	190	194	187	181	184	188	192
		Expansion	96	140	74	97	109	102	102	92	83	84	85	86
		Replacement	69	73	76	80	84	88	92	95	98	100	103	106
		Employment	2,334	2,474	2,548	2,645	2,754	2,856	2,958	3,050	3,133	3,217	3,302	3,388
		Repl. Rate	.0294	.0297	.0300	.0303	.0306	.0309	.0312	.0312	.0312	.0312	.0312	.0312
09.02.97	Alcoholism Counseling	Total Demand	238	301	211	252	279	278	284	274	267	272	277	282
		Expansion	149	205	111	147	169	162	162	148	137	138	139	140
		Replacement	89	96	100	105	110	116	122	126	130	134	138	142
		Employment	3,284	3,489	3,600	3,747	3,916	4,078	4,240	4,388	4,525	4,663	4,802	4,942
		Repl. Rate	.0272	.0274	.0277	.0279	.0282	.0284	.0287	.0287	.0287	.0287	.0287	.0287
09.02.98	Human Service	Total Demand	398	507	363	429	472	470	481	466	453	463	470	479
		Expansion	218	314	162	217	248	235	234	211	191	194	194	196
		Replacement	180	193	201	212	224	235	247	255	262	269	276	283
		Employment	5,292	5,606	5,768	5,985	6,233	6,468	6,702	6,913	7,104	7,298	7,492	7,688
		Repl. Rate	.0339	.0344	.0349	.0354	.0359	.0364	.0368	.0368	.0368	.0368	.0368	.0368
09.02.99	Social Service	Total Demand	168	224	152	179	198	194	196	188	180	185	186	190
		Expansion	96	147	72	96	111	103	101	90	80	82	81	83
		Replacement	72	77	80	83	87	91	95	98	100	103	105	107
		Employment	2,619	2,766	2,838	2,934	3,045	3,148	3,249	3,339	3,419	3,501	3,582	3,665
		Repl. Rate	.0274	.0277	.0280	.0283	.0287	.0290	.0293	.0293	.0293	.0293	.0293	.0293
	Field Total	Total Demand	1,504	1,959	1,256	1,491	1,616	1,542	1,532	1,422	1,333	1,333	1,318	1,316
		Expansion	588	1,005	290	505	606	511	481	361	266	260	241	235
		Replacement	916	954	966	986	1,010	1,031	1,051	1,061	1,067	1,073	1,077	1,081
		Employment	24,770	25,775	26,065	26,570	27,176	27,687	28,168	28,529	28,795	29,055	29,296	29,531
		Repl. Rate	.0370	.0370	.0371	.0371	.0372	.0372	.0373	.0373	.0373	.0373	.0373	.0373

Note: Before using values presented in this table see Part III, Section 1, Interpreting the Forecast Results.

WASHINGTON STATE JOB OPPORTUNITIES FORECAST - THIRD EDITION

JOF TABLE 13

SECTION 1: VOCATIONAL EDUCATION PROGRAMS
FIELD 14.00.00 BUSINESS AND OFFICE OCCUPATIONS

JUNE, 1977

OE CODE	PROGRAM TITLE/ REFERENCE	DEMAND/ EMPLOYMENT	FISCAL YEARS 1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
14.01.01	Accounting	Total Demand	3,269	3,284	2,126	3,079	3,477	3,396	3,454	3,365	3,190	3,076	2,968	2,894
		Expansion	1,606	1,548	354	1,243	1,564	1,410	1,395	1,263	1,053	908	774	677
		Replacement	1,663	1,736	1,772	1,836	1,913	1,986	2,059	2,102	2,137	2,168	2,194	2,217
		Employment	53,500	55,048	55,402	56,645	58,209	59,619	61,014	62,277	63,330	64,238	65,012	65,689
		Repl. Rate	.0311	.0315	.0320	.0324	.0329	.0333	.0338	.0338	.0338	.0338	.0338	.0338
14.01.05	Teller Training	Total Demand	247	202	210	257	269	230	246	255	244	241	236	231
		Expansion	125	76	81	123	129	86	97	103	90	84	77	70
		Replacement	122	126	129	134	140	144	149	152	154	157	159	161
		Employment	4,461	4,537	4,618	4,741	4,870	4,956	5,053	5,156	5,246	5,330	5,407	5,477
		Repl. Rate	.0273	.0277	.0280	.0284	.0287	.0291	.0294	.0294	.0294	.0294	.0294	.0294
14.02.00	Data Processing	Total Demand	1,304	1,002	332	918	1,275	1,294	1,325	1,285	1,230	1,179	1,128	1,060
		Expansion	949	627	-49	519	851	844	848	790	719	554	590	510
		Replacement	355	375	381	399	424	450	477	495	511	525	538	550
		Employment	17,669	18,296	18,247	18,766	19,617	20,461	21,309	22,099	22,818	23,472	24,062	24,572
		Repl. Rate	.0201	.0205	.0209	.0212	.0216	.0220	.0224	.0224	.0224	.0224	.0224	.0224
14.02.02	Keypunch	Total Demand	96	63	-28	36	59	47	38	25	5	-7	-18	-32
		Expansion	8	-25	-114	-50	-28	-40	-48	-60	-77	-87	-95	-106
		Replacement	88	88	86	86	87	87	86	85	82	80	77	74
		Employment	3,177	3,152	3,038	2,988	2,960	2,920	2,872	2,812	2,735	2,648	2,553	2,447
		Repl. Rate	.0275	.0280	.0284	.0288	.0292	.0297	.0301	.0301	.0301	.0301	.0301	.0301
14.03.01	Duplicating Machine Operation	Total Demand	38	38	20	32	38	36	37	36	33	32	32	30
		Expansion	21	20	2	14	19	16	17	15	12	11	10	8
		Replacement	17	18	18	18	19	20	20	21	21	21	22	22
		Employment	576	596	598	612	631	647	664	679	691	702	712	720
		Repl. Rate	.0291	.0294	.0296	.0299	.0301	.0303	.0306	.0306	.0306	.0306	.0306	.0306
14.03.99	Micrographics	Total Demand	232	242	160	223	247	242	245	237	224	216	205	202
		Expansion	102	107	23	82	101	92	90	79	64	53	42	37
		Replacement	130	135	137	141	146	150	155	158	160	162	163	165
		Employment	3,718	3,825	3,848	3,930	4,031	4,123	4,213	4,292	4,356	4,409	4,451	4,488
		Repl. Rate	.0350	.0353	.0355	.0358	.0361	.0364	.0367	.0367	.0367	.0367	.0367	.0367

Note: Before using values presented in this table see Part III, Section 1, Interpreting the Forecast Results.

WASHINGTON STATE JOB OPPORTUNITIES FORECAST - THIRD EDITION

JOF TABLE 14

SECTION I: VOCATIONAL EDUCATION PROGRAMS
FIELD 14.00.00 BUSINESS AND OFFICE OCCUPATIONS

JUNE, 1977

OE CODE	PROGRAM TITLE/ REFERENCE	DEMAND/ EMPLOYMENT	FISCAL YEARS 1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
14.04.96	Community Planning	Total Demand	11	22	10	14	17	18	17	15	14	14	15	17
		Expansion	8	19	7	11	13	14	13	11	10	10	11	12
		Replacement	3	3	3	3	4	4	4	4	4	4	4	5
		Employment	310	329	336	347	360	374	387	398	408	418	429	441
		Repl. Rate	.0095	.0096	.0098	.0099	.0100	.0102	.0103	.0103	.0103	.0103	.0103	.0103
14.04.97	Medical Records Technology	Total Demand	140	178	128	149	161	158	160	153	149	153	153	157
		Expansion	75	109	56	74	83	76	75	66	60	61	59	61
		Replacement	65	69	72	75	78	82	85	87	89	92	94	96
		Employment	1,943	2,052	2,108	2,182	2,265	2,341	2,416	2,482	2,542	2,603	2,662	2,723
		Repl. Rate	.0334	.0337	.0340	.0343	.0346	.0349	.0352	.0352	.0352	.0352	.0352	.0352
14.04.98	Library Technology	Total Demand	364	459	291	350	379	358	356	327	306	304	298	295
		Expansion	121	206	35	89	112	86	79	48	26	23	16	13
		Replacement	243	253	256	261	267	272	277	279	280	281	282	282
		Employment	5,866	6,072	6,107	6,196	6,308	6,394	6,473	6,521	6,557	6,570	6,586	6,599
		Repl. Rate	.0414	.0416	.0419	.0421	.0423	.0426	.0428	.0428	.0428	.0428	.0428	.0428
14.04.99	Mass Communications	Total Demand	234	247	163	239	263	257	278	268	271	261	253	257
		Expansion	149	156	69	139	157	146	160	146	145	132	121	121
		Replacement	85	91	94	100	106	111	118	122	126	129	132	136
		Employment	3,540	3,696	3,765	3,904	4,061	4,207	4,367	4,513	4,648	4,790	4,911	5,032
		Repl. Rate	.0241	.0245	.0250	.0255	.0260	.0265	.0270	.0270	.0270	.0270	.0270	.0270
14.05.04	Stock and Inventory Clerk	Total Demand	1,184	1,151	627	1,031	1,203	1,290	1,310	1,247	1,148	1,062	984	962
		Expansion	792	738	202	587	737	800	795	719	608	513	426	397
		Replacement	392	413	425	444	466	490	515	528	540	549	558	565
		Employment	23,268	24,006	24,208	24,795	25,532	26,332	27,127	27,846	28,454	28,967	29,393	29,790
		Repl. Rate	.0169	.0172	.0176	.0179	.0183	.0186	.0190	.0190	.0190	.0190	.0190	.0190
14.06.00	Personnel and Labor Relations	Total Demand	524	647	340	443	518	547	572	551	502	495	518	504
		Expansion	246	352	38	131	193	209	220	193	139	128	146	128
		Replacement	278	295	302	312	325	338	352	358	363	367	372	376
		Employment	9,251	9,603	9,641	9,772	9,965	10,174	10,394	10,587	10,726	10,854	11,000	11,128
		Repl. Rate	.0301	.0307	.0313	.0319	.0326	.0332	.0338	.0338	.0338	.0338	.0338	.0338

Note: Before using values presented in this table see Part III, Section 1, Interpreting the Forecast Results.

WASHINGTON STATE JOB OPPORTUNITIES FORECAST - THIRD EDITION

JOF TABLE 15

SECTION 1: VOCATIONAL EDUCATION PROGRAMS
FIELD 14.00.00 BUSINESS AND OFFICE OCCUPATIONS

JUNE, 1977

OE CODE	PROGRAM TITLE/ REFERENCE	DEMAND/ EMPLOYMENT	FISCAL YEARS 1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
14.07.00	Secretarial Science	Total Demand	3,634	3,786	2,659	3,571	4,062	4,140	4,299	4,294	4,195	4,209	4,253	4,282
		Expansion	2,279	2,341	1,161	1,992	2,388	2,369	2,428	2,343	2,170	2,112	2,085	2,044
		Replacement	1,355	1,445	1,498	1,579	1,674	1,771	1,871	1,951	2,025	2,097	2,168	2,238
		Employment	42,151	44,492	45,653	47,645	50,033	52,402	54,830	57,173	59,343	61,455	63,540	65,584
		Repl. Rate	.0321	.0325	.0328	.0331	.0335	.0338	.0341	.0341	.0341	.0341	.0341	.0341
14.07.02	Medical Secretary	Total Demand	45	55	42	48	52	51	53	51	51	52	53	54
		Expansion	27	36	22	27	30	28	29	26	25	25	25	25
		Replacement	18	19	20	21	22	23	24	25	26	27	28	29
		Employment	530	566	588	615	645	673	702	728	753	778	803	828
		Repl. Rate	.0334	.0337	.0339	.0341	.0344	.0346	.0348	.0348	.0348	.0348	.0348	.0348
14.07.03	Stenographer	Total Demand	742	778	546	731	825	818	841	832	811	813	812	811
		Expansion	425	443	201	370	446	421	425	402	368	357	344	311
		Replacement	317	335	345	361	379	397	416	430	443	456	468	480
		Employment	9,397	9,840	10,041	10,411	10,817	11,278	11,703	12,105	12,473	12,830	13,174	13,505
		Repl. Rate	.0338	.0341	.0344	.0346	.0349	.0352	.0355	.0355	.0355	.0355	.0355	.0355
14.07.95	Insurance Secretary	Total Demand	930	928	736	944	1,043	1,009	1,047	1,050	1,028	1,030	1,029	1,027
		Expansion	531	508	302	489	564	507	522	507	469	455	439	422
		Replacement	399	420	434	455	479	502	525	543	559	575	590	605
		Employment	12,085	12,593	12,895	13,384	13,948	14,455	14,977	15,484	15,953	16,408	16,847	17,269
		Repl. Rate	.0330	.0334	.0337	.0340	.0344	.0347	.0350	.0350	.0350	.0350	.0350	.0350
14.07.96	Real Estate Secretary	Total Demand	737	770	573	744	835	831	857	854	841	845	848	851
		Expansion	444	459	251	405	476	453	459	441	413	403	392	382
		Replacement	293	311	322	339	359	378	398	413	428	442	456	469
		Employment	8,745	9,204	9,455	9,860	10,336	10,789	11,248	11,689	12,102	12,505	12,897	13,279
		Repl. Rate	.0335	.0338	.0341	.0344	.0347	.0350	.0353	.0353	.0353	.0353	.0353	.0353
14.07.97	Medical Transcription	Total Demand	35	44	34	39	42	41	42	42	41	42	43	44
		Expansion	21	29	18	22	24	23	23	22	20	20	21	21
		Replacement	14	15	16	17	18	18	19	20	21	22	22	23
		Employment	416	445	463	485	509	532	555	577	597	617	638	659
		Repl. Rate	.0335	.0337	.0340	.0342	.0344	.0347	.0349	.0349	.0349	.0349	.0349	.0349

Note: Before using values presented in this table see Part III, Section 1, Interpreting the Forecast Results.

JOF TABLE 15

WASHINGTON STATE JOB OPPORTUNITIES FORECAST - THIRD EDITION

SECTION 1: VOCATIONAL EDUCATION PROGRAMS
FIELD 14.00.00 BUSINESS AND OFFICE OCCUPATIONS

JOF TABLE 16

JUNE 1977

OE CODE	PROGRAM TITLE/ REFERENCE	DEMAND/ EMPLOYMENT	FISCAL YEARS 1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
14.07.98	Legal Secretary	Total Demand	281	370	284	296	330	340	353	347	333	340	354	361
		Expansion	161	240	119	154	180	182	186	174	155	157	165	166
		Replacement	120	130	135	142	150	158	167	173	178	183	189	195
		Employment	3,799	4,039	4,158	4,312	4,492	4,674	4,860	5,034	5,189	5,346	5,511	5,677
		Repl. Rate	.0316	.0321	.0325	.0330	.0334	.0339	.0343	.0343	.0343	.0343	.0343	.0343
14.07.99	Court Reporter	Total Demand	6	6	-1	3	3	3	3	1	-1	-1	-1	-3
		Expansion	-1	-1	-8	-4	-4	-4	-4	-5	-7	-7	-7	-8
		Replacement	7	7	7	7	7	7	7	6	6	6	6	5
		Employment	199	198	190	186	182	178	174	169	162	155	148	140
		Repl. Rate	.0358	.0362	.0365	.0369	.0372	.0376	.0379	.0379	.0379	.0379	.0379	.0379
14.08.05	Business Management	Total Demand	1,405	1,384	1,025	1,451	1,622	1,599	1,659	1,663	1,626	1,574	1,521	1,504
		Expansion	806	750	367	755	884	820	837	815	753	679	606	570
		Replacement	599	634	658	696	738	779	822	848	873	895	915	934
		Employment	20,639	21,389	21,756	22,511	23,395	24,215	25,052	25,867	26,620	27,299	27,905	28,475
		Repl. Rate	.0290	.0296	.0303	.0309	.0315	.0322	.0328	.0328	.0328	.0328	.0328	.0328
14.08.99	Legal Assisting (Based on the Number of Lawyers)	Total Demand	417	525	386	460	511	517	535	524	512	523	534	545
		Expansion	253	344	192	251	285	273	274	253	232	235	237	239
		Replacement	164	181	194	209	226	244	261	271	280	288	297	306
		Employment	5,410	5,754	5,946	6,197	6,482	6,755	7,029	7,282	7,514	7,749	7,986	8,225
		Repl. Rate	.0303	.0315	.0326	.0337	.0349	.0361	.0372	.0372	.0372	.0372	.0372	.0372
14.09.00	Typist (and Related Occupations)	Total Demand	1,160	1,237	801	1,095	1,243	1,246	1,280	1,256	1,208	1,197	1,210	1,200
		Expansion	648	696	246	517	638	613	619	576	510	482	479	453
		Replacement	512	541	555	578	605	633	661	680	698	715	731	747
		Employment	15,870	16,566	16,812	17,329	17,967	18,580	19,199	19,775	20,285	20,767	21,246	21,699
		Repl. Rate	.0323	.0326	.0330	.0333	.0337	.0341	.0344	.0344	.0344	.0344	.0344	.0344
	Field Total	Total Demand	17,035	17,418	11,434	16,153	18,474	18,468	19,007	18,678	17,961	17,649	17,428	17,253
		Expansion	9,796	9,778	3,575	7,940	9,842	9,424	9,539	8,927	7,957	7,408	6,963	6,573
		Replacement	7,239	7,640	7,859	8,213	8,632	9,044	9,468	9,751	10,004	10,241	10,465	10,680
		Employment	246,520	256,298	259,873	267,813	277,655	287,079	296,618	305,545	313,502	320,910	327,873	334,446
		Repl. Rate	.0294	.0298	.0302	.0307	.0311	.0315	.0319	.0319	.0319	.0319	.0319	.0319

Note: Before using values presented in this table see Part III, Section 1, Interpreting the Forecast Results.

WASHINGTON STATE JOB OPPORTUNITIES FORECAST - THIRD EDITION

JOF TABLE 17

SECTION 1: VOCATIONAL EDUCATION PROGRAMS
FIELD 16.00.00 TECHNICAL OCCUPATIONS

JUNE, 1977

OE CODE	PROGRAM TITLE/ REFERENCE	DEMAND/ EMPLOYMENT	FISCAL YEARS 1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
16.01.00	Engineering Technology	Total Demand	53	43	15	40	55	55	56	53	52	48	47	40
		Expansion	42	31	3	27	41	40	40	37	35	31	29	22
		Replacement	11	12	12	13	14	15	16	16	17	17	18	18
		Employment	784	815	818	845	886	926	966	1,003	1,038	1,069	1,098	1,120
		Repl. Rate	.0146	.0149	.0152	.0154	.0157	.0159	.0162	.0162	.0162	.0162	.0162	.0162
16.01.03	Construction Technology	Total Demand		33	16	33	42	41	42	41	41	38	35	33
		Expansion	29	24	6	23	31	29	29	28	27	24	21	18
		Replacement	9	9	10	10	11	12	13	13	14	14	14	15
		Employment	565	589	595	618	649	678	707	735	762	786	807	825
		Repl. Rate	.0156	.0160	.0164	.0168	.0172	.0176	.0180	.0180	.0180	.0180	.0180	.0180
16.01.05	Chemical Technology	Total Demand	65	77	30	59	75	62	63	59	57	59	54	52
		Expansion	45	56	8	36	51	37	38	33	30	32	26	24
		Replacement	20	21	22	23	24	25	25	26	27	27	28	28
		Employment	1,195	1,251	1,259	1,295	1,346	1,383	1,421	1,454	1,484	1,516	1,542	1,566
		Repl. Rate	.0170	.0171	.0173	.0174	.0176	.0178	.0179	.0179	.0179	.0179	.0179	.0179
16.01.06	Civil Engineering Technology	Total Demand	134	134	64	131	165	152	158	164	159	144	132	124
		Expansion	93	91	19	84	114	98	101	105	98	82	68	59
		Replacement	41	43	45	47	51	54	57	59	61	62	64	65
		Employment	2,294	2,385	2,404	2,488	2,602	2,700	2,801	2,906	3,004	3,086	3,154	3,213
		Repl. Rate	.0178	.0182	.0186	.0190	.0194	.0198	.0202	.0202	.0202	.0202	.0202	.0202
16.01.07	Electrical Power Technology	Total Demand	476	337	49	327	466	445	472	487	463	409	373	323
		Expansion	346	200	-90	182	311	280	292	306	276	217	177	125
		Replacement	130	137	139	145	155	165	174	181	187	192	196	198
		Employment	6,896	7,096	7,006	7,188	7,499	7,779	8,077	8,383	8,559	8,876	9,053	9,178
		Repl. Rate	.0189	.0193	.0198	.0202	.0207	.0211	.0216	.0216	.0216	.0216	.0216	.0216
16.01.08	Electronic Technology	Total Demand	206	170	47	130	178	190	209	209	195	191	199	187
		Expansion	164	125	1	82	127	136	151	148	132	125	131	117
		Replacement	42	45	46	48	51	54	58	61	63	66	68	70
		Employment	2,519	2,644	2,645	2,727	2,854	2,990	3,141	3,289	3,421	3,546	3,677	3,794
		Repl. Rate	.0167	.0170	.0173	.0176	.0179	.0182	.0185	.0185	.0185	.0185	.0185	.0185

Note: Before using values presented in this table see Part III, Section 1, Interpreting the Forecast Results.

WASHINGTON STATE JOB OPPORTUNITIES FORECAST - THIRD EDITION

JOF TABLE 18

SECTION 1: VOCATIONAL EDUCATION PROGRAMS
FIELD 16.00.CO TECHNICAL OCCUPATIONS

JUNE, 1977

OE CODE	PROGRAM TITLE/ REFERENCE	DEMAND/ EMPLOYMENT	FISCAL YEARS 1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
16.01.09	Electro-mechanical Technology	Total Demand	46	34	9	29	42	43	47	47	44	44	45	41
		Expansion	41	29	4	24	36	37	40	40	37	36	37	33
		Replacement	5	5	5	5	6	6	7	7	7	8	8	8
		Employment	501	530	534	558	594	631	671	711	748	784	821	854
		Repl. Rate	.0093	.0094	.0095	.0095	.0096	.0096	.0097	.0097	.0097	.0097	.0097	.0097
16.01.10	Environmental Control Tech. Commercial Refrig/Air Conditioning	Total Demand	36	31	14	28	38	37	38	37	36	35	33	31
		Expansion	29	23	6	20	29	28	28	27	25	24	22	19
		Replacement	7	8	8	8	9	9	10	10	11	11	11	12
		Employment	484	507	513	533	562	590	618	645	670	694	716	735
		Repl. Rate	.0146	.0148	.0150	.0153	.0155	.0157	.0159	.0159	.0159	.0159	.0159	.0159
16.01.11	Industrial Technology	Total Demand	245	133	-51	78	179	195	192	178	166	159	151	133
		Expansion	203	89	-94	34	132	145	139	123	109	100	91	71
		Replacement	42	44	43	44	47	50	53	55	57	59	60	62
		Employment	2,540	2,629	2,535	2,569	2,701	2,846	2,985	3,108	3,217	3,317	3,408	3,479
		Repl. Rate	.0165	.0167	.0169	.0171	.0173	.0175	.0177	.0177	.0177	.0177	.0177	.0177
16.01.13	Mechanical Engineering Technology (Includes 30% of Mechanical Engineers)	Total Demand	163	110	-4	81	143	153	154	145	140	136	133	120
		Expansion	137	82	-32	51	111	118	116	106	99	93	89	74
		Replacement	26	28	28	30	32	35	38	39	41	43	44	46
		Employment	1,722	1,804	1,772	1,823	1,934	2,052	2,168	2,274	2,373	2,466	2,555	2,629
		Repl. Rate	.0154	.0157	.0160	.0164	.0167	.0170	.0174	.0174	.0174	.0174	.0174	.0174
16.01.15	Nuclear Technology	Total Demand	36	31	14	28	38	37	38	37	36	35	33	31
		Expansion	29	23	6	20	29	28	28	27	25	24	22	19
		Replacement	7	8	8	8	9	9	10	10	11	11	11	12
		Employment	484	507	513	533	562	590	618	645	670	694	716	735
		Repl. Rate	.0146	.0148	.0150	.0153	.0155	.0157	.0159	.0159	.0159	.0159	.0159	.0159
16.01.16	Natural Gas and Petroleum Technology	Total Demand	4	6	3	4	5	5	5	5	5	5	5	4
		Expansion	3	5	2	3	4	4	4	4	4	4	4	3
		Replacement	1	1	1	1	1	1	1	1	1	1	1	1
		Employment	52	57	59	62	66	70	74	78	82	86	90	93
		Repl. Rate	.0148	.0148	.0149	.0150	.0151	.0151	.0152	.0152	.0152	.0152	.0152	.0152

Note: Before using values presented in this table see Part III, Section 1, Interpreting the Forecast Results.

WASHINGTON STATE JOB OPPORTUNITIES FORECAST - THIRD EDITION

SECTION 1: VOCATIONAL EDUCATION PROGRAMS
FIELD 16.00.00 TECHNICAL OCCUPATIONS

JOF TABLE 19 — JUNE, 1977

OE CODE	PROGRAM TITLE/ REFERENCE	DEMAND/ EMPLOYMENT	FISCAL YEARS 1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
16.01.51	Environmental Technology	Total Demand	27	21	8	20	28	27	28	27	25	25	23	20
		Expansion	21	15	2	13	21	20	20	19	17	16	14	11
		Replacement	6	6	6	7	7	7	8	8	8	9	9	9
		Employment	392	407	409	422	443	463	483	502	519	535	549	560
		Repl. Rate	.0146	.0149	.0152	.0154	.0157	.0159	.0162	.0162	.0162	.0162	.0162	.0162
16.01.52	Concrete Technology	Total Demand	28	30	20	39	44	35	38	45	46	36	27	24
		Expansion	13	14	4	22	26	16	18	24	24	14	5	2
		Replacement	15	16	16	17	18	19	20	21	22	22	22	22
		Employment	603	617	621	643	669	685	703	727	751	765	770	772
		Repl. Rate	.0250	.0257	.0263	.0270	.0276	.0282	.0289	.0289	.0289	.0289	.0289	.0289
16.01.54	Land Survey Technology	Total Demand	66	78	53	84	93	85	91	94	93	86	80	78
		Expansion	46	56	30	59	66	56	60	62	60	51	45	42
		Replacement	20	22	23	25	27	29	31	32	33	35	35	36
		Employment	1,192	1,248	1,278	1,337	1,403	1,459	1,519	1,581	1,641	1,692	1,737	1,779
		Repl. Rate	.0170	.0176	.0182	.0187	.0193	.0199	.0204	.0204	.0204	.0204	.0204	.0204
16.01.94	Quality Control Technology	Total Demand	218	124	19	119	176	196	196	187	182	179	171	151
		Expansion	165	68	-37	61	114	130	126	114	107	101	91	69
		Replacement	53	56	56	58	62	66	70	73	75	78	80	82
		Employment	2,356	2,424	2,387	2,448	2,562	2,692	2,818	2,932	3,039	3,140	3,[illegible]	3,300
		Repl. Rate	.0227	.0230	.0234	.0237	.0241	.0244	.0248	.0248	.0248	.0248	.0248	.0248
16.01.95	Communications Electronics	Total Demand	195	208	105	164	192	205	220	217	203	196	202	197
		Expansion	140	148	43	99	123	131	142	136	119	110	113	106
		Replacement	55	60	62	65	69	74	78	81	84	86	89	91
		Employment	3,005	3,153	3,196	3,295	3,418	3,549	3,691	3,827	3,946	4,056	4,169	4,275
		Repl. Rate	.0184	.0189	.0194	.0198	.0203	.0208	.0213	.0213	.0213	.0213	.0213	.0213
16.01.96	Biomedical Equipment Maintenance and Repair	Total Demand	31	22	5	18	25	26	29	29	27	26	27	24
		Expansion	27	18	0	13	20	21	23	23	21	19	20	17
		Replacement	4	4	5	5	5	5	6	6	6	7	7	7
		Employment	355	373	373	386	406	427	450	473	494	513	533	550
		Repl. Rate	.0118	.0119	.0121	.0123	.0125	.0127	.0129	.0129	.0129	.0129	.0129	.0129

Note: Before using values presented in this table see Part III, Section 1, Interpreting the Forecast Results.

WASHINGTON STATE JOB OPPORTUNITIES FORECAST - THIRD EDITION

JOF TABLE 20

SECTION 1: VOCATIONAL EDUCATION PROGRAMS
FIELD 16.00.00 TECHNICAL OCCUPATIONS

JUNE, 1977

OE CODE	PROGRAM TITLE/ REFERENCE	DEMAND/ EMPLOYMENT	FISCAL YEARS 1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
16.01.97	Industrial Electronics	Total Demand	28	17	2	13	20	21	24	24	22	20	22	20
		Expansion	24	13	-2	9	16	17	19	19	17	15	16	14
		Replacement	4	4	4	4	4	4	5	5	5	5	6	6
		Employment	310	323	321	330	346	363	382	401	418	433	449	463
		Repl. Rate	.0114	.0115	.0117	.0119	.0121	.0122	.0124	.0124	.0124	.0124	.0124	.0124
16.01.98	Aviation Electronics	Total Demand	365	146	-175	31	213	255	256	222	200	185	178	139
		Expansion	327	106	-213	-8	171	210	207	171	147	130	121	81
		Replacement	38	40	38	39	42	45	49	51	53	55	57	58
		Employment	2,982	3,088	2,875	2,867	3,038	3,248	3,455	3,626	3,773	3,903	4,024	4,105
		Repl. Rate	.0128	.0130	.0133	.0135	.0137	.0139	.0141	.0141	.0141	.0141	.0141	.0141
16.01.99	Marine Technology	Total Demand	58	47	24	51	60	60	62	61	57	57	55	52
		Expansion	44	32	9	35	43	42	43	41	37	36	34	30
		Replacement	14	15	15	16	17	18	19	20	20	21	21	22
		Employment	830	862	871	906	949	991	1,034	1,075	1,112	1,148	1,182	1,212
		Repl. Rate	.0168	.0170	.0172	.0175	.0177	.0179	.0182	.0182	.0182	.0182	.0182	.0182
16.02.03	Food Processing Technology	Total Demand	573	710	559	648	686	741	778	768	747	[illegible]	720	746
		Expansion	294	414	252	326	349	387	406	382	349	319	299	314
		Replacement	279	296	307	322	337	354	372	386	398	410	421	432
		Employment	8,202	8,616	8,868	9,194	9,543	9,930	10,336	10,718	11,067	11,386	11,685	11,999
		Repl. Rate	.0340	.0343	.0346	.0350	.0353	.0357	.0360	.0360	.0360	.0360	.0360	.0360
16.05.98	Executive Housekeeping Technology	Total Demand	1,257	1,492	1,122	1,350	1,472	1,483	1,526	1,488	1,449	1,459	1,457	1,474
		Expansion	527	711	307	492	565	529	524	462	402	391	370	367
		Replacement	730	781	815	858	906	954	1,002	1,026	1,047	1,068	1,087	1,107
		Employment	15,984	16,695	17,002	17,494	18,060	18,589	19,113	19,575	19,977	20,368	20,738	21,105
		Repl. Rate	.0457	.0468	.0479	.0490	.0502	.0513	.0524	.0524	.0524	.0524	.0524	.0524
16.06.01	Commercial Pilot	Total Demand	111	33	-32	73	83	88	90	79	70	64	68	52
		Expansion	87	8	-56	48	57	61	61	50	40	34	38	21
		Replacement	24	25	24	25	26	27	29	29	30	30	30	31
		Employment	2,344	2,352	2,296	2,344	2,401	2,462	2,523	2,573	2,613	2,647	2,685	2,706
		Repl. Rate	.0103	.0105	.0106	.0108	.0110	.0112	.0113	.0113	.0113	.0113	.0113	.0113

Note: Before using values presented in this table see Part III, Section 1, Interpreting the Forecast Results.

WASHINGTON STATE JOB OPPORTUNITIES FORECAST - THIRD EDITION

SECTION 1: VOCATIONAL EDUCATION PROGRAMS
FIELD 16.00.00 TECHNICAL OCCUPATIONS

JOF TABLE 21

JUNE, 1977

OE CODE	PROGRAM TITLE/ REFERENCE	DEMAND/ EMPLOYMENT	FISCAL YEARS 1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
16.06.03	Forestry Technology	Total Demand	56	0	36	75	68	61	60	62	59	56	53	46
		Expansion	26	-30	5	43	34	26	24	25	22	18	15	8
		Replacement	30	30	31	32	34	35	36	37	37	38	38	38
		Employment	1,283	1,253	1,258	1,301	1,335	1,361	1,385	1,410	1,432	1,450	1,465	1,473
		Repl. Rate	.0235	.0240	.0244	.0248	.0253	.0257	.0261	.0261	.0261	.0261	.0261	.0261
16.06.04	Marine Science Technology	Total Demand	16	17	14	16	15	16	17	18	16	18	18	17
		Expansion	11	12	9	10	9	10	10	11	9	11	10	9
		Replacement	5	5	5	6	6	6	7	7	7	7	8	8
		Employment	186	198	207	217	226	236	246	257	266	277	287	296
		Repl. Rate	.0242	.0246	.0250	.0254	.0258	.0262	.0266	.0266	.0266	.0266	.0266	.0266
16.06.96	Oceanographic Technology	Total Demand	22	19	11	18	23	24	25	23	23	23	21	21
		Expansion	18	15	6	13	18	18	19	17	17	16	14	14
		Replacement	4	4	5	5	5	6	6	6	6	7	7	7
		Employment	288	303	309	322	340	358	377	394	411	427	441	455
		Repl. Rate	.0146	.0148	.0150	.0152	.0154	.0156	.0158	.0158	.0158	.0158	.0158	.0158
16.06.97	Marine Biology Technology	Total Demand	22	19	11	18	23	24	25	23	23	23	21	21
		Expansion	18	15	6	13	18	18	19	17	17	16	14	14
		Replacement	4	4	5	5	5	6	6	6	6	7	7	7
		Employment	288	303	309	322	340	358	377	394	411	427	441	455
		Repl. Rate	.0146	.0148	.0150	.0152	.0154	.0156	.0158	.0158	.0158	.0158	.0158	.0158
16.06.98	Diving Technology	Total Demand	31	26	11	24	32	33	32	32	32	29	28	25
		Expansion	25	19	4	17	24	25	23	23	22	19	18	15
		Replacement	6	7	7	7	8	8	9	9	10	10	10	10
		Employment	438	457	461	478	502	527	550	573	595	614	632	647
		Repl. Rate	.0146	.0149	.0151	.0153	.0156	.0158	.0160	.0160	.0160	.0160	.0160	.0160
16.06.99	Sign Language Interpreter	Total Demand	78	103	71	83	91	91	91	87	84	87	88	89
		Expansion	50	73	40	51	57	55	54	49	45	46	46	46
		Replacement	28	30	31	32	34	36	37	38	39	41	42	43
		Employment	1,172	1,245	1,285	1,336	1,393	1,448	1,502	1,551	1,596	1,642	1,688	1,734
		Repl. Rate	.0238	.0240	.0241	.0243	.0244	.0246	.0247	.0247	.0247	.0247	.0247	.0247

Note: Before using values presented in this table see Part III, Section 1, Interpreting the Forecast Results.

JOF TABLE 21

WASHINGTON STATE JOB OPPORTUNITIES FORECAST - THIRD EDITION

SECTION 1: VOCATIONAL EDUCATION PROGRAMS
FIELD 16.00.00 TECHNICAL OCCUPATIONS

JOF TABLE 22

JUNE, 1977

OE CODE	PROGRAM TITLE/ REFERENCE	DEMAND/ EMPLOYMENT	FISCAL YEARS 1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
	Field Total	Total Demand	4,684	4,251	2,070	3,812	4,770	4,886	5,062	4,948	4,752	4,601	4,499	4,315
		Expansion	3,024	2,485	248	1,902	2,748	2,752	2,810	2,629	2,369	2,154	2,000	1,764
		Replacement	1,660	1,766	1,822	1,910	2,022	2,134	2,252	2,319	2,383	2,447	2,499	2,551
		Employment	62,246	64,731	64,979	66,881	69,629	72,381	75,191	77,820	80,189	82,343	84,343	86,107
		Repl. Rate	.0267	.0273	.0280	.0285	.0290	.0295	.0300	.0300	.0300	.0300	.0300	.0300

Note: Before using values presented in this table see Part III, Section 1, Interpreting the Forecast Results.

JOF TABLE 23

SECTION 1: VOCATIONAL EDUCATION PROGRAMS
FIELD 17.00.00 TRADE AND INDUSTRIAL OCCUPATIONS

JUNE, 1977

OE CODE	PROGRAM TITLE/ REFERENCE	DEMAND/ EMPLOYMENT	FISCAL YEARS 1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
17.01.00	Commercial Refrigeration and Air Conditioning Maintenance	Total Demand	172	164	104	167	195	198	209	216	212	199	186	178
		Expansion	108	96	32	90	112	109	114	117	109	93	78	68
		Replacement	64	68	72	77	83	89	95	99	103	106	108	110
		Employment	2,310	2,406	2,438	2,528	2,640	2,749	2,963	2,980	3,089	3,182	3,260	3,328
		Repl. Rate	.0275	.0285	.0294	.0303	.0313	.0322	.0332	.0332	.0332	.0332	.0332	.0332
17.02.00	Appliance and Vending Machine Repair	Total Demand	100	119	73	107	121	121	126	127	118	111	106	108
		Expansion	60	76	29	60	72	69	71	70	60	52	46	46
		Replacement	40	43	44	47	49	52	55	57	58	59	60	62
		Employment	1,923	1,999	2,028	2,088	2,160	2,229	2,300	2,370	2,430	2,482	2,528	2,574
		Repl. Rate	.0208	.0213	.0218	.0223	.0228	.0234	.0239	.0239	.0239	.0239	.0239	.0239
17.03.01	Auto Body Rebuilding	Total Demand	104	145	62	98	109	99	98	84	66	55	44	41
		Expansion	53	92	7	41	50	39	36	21	3	-7	-18	-21
		Replacement	51	53	55	57	59	60	62	63	63	62	62	62
		Employment	3,823	3,915	3,922	3,963	4,013	4,052	4,088	4,109	4,112	4,105	4,087	4,066
		Repl Rate	.0133	.0137	.0140	.0143	.0146	.0149	.0152	.0152	.0152	.0152	.0152	.0152
17.03.02	Automotive Mechanics	Total Demand	660	763	479	735	801	822	840	806	758	717	686	691
		Expansion	372	458	162	401	448	449	447	404	347	299	262	261
		Replacement	288	305	317	334	353	373	393	402	411	418	425	430
		Employment	14,017	14,475	14,637	15,038	15,486	15,935	16,382	16,786	17,133	17,432	17,694	17,955
		Repl. Rate	.0205	.0217	.0217	.0222	.0228	.0234	.0240	.0240	.0240	.0240	.0240	.0240
17.03.03	Automotive Machinist	Total Demand	11	9	0	8	13	14	14	12	12	11	10	9
		Expansion	7	4	-5	3	8	9	8	6	6	5	4	3
		Replacement	4	5	5	5	5	5	6	6	6	6	6	6
		Employment	180	184	179	182	190	199	207	213	219	224	228	231
		Repl. Rate	.0239	.0245	.0252	.0258	.0264	.0271	.0277	.0277	.0277	.0277	.0277	.0277
17.03.98	Trailer Rebuilding and Refinishing	Total Demand	0	2	-14	11	21	16	9	6	6	8	6	8
		Expansion	-4	-2	-17	7	17	11	4	1	1	3	1	3
		Replacement	4	4	3	4	4	5	5	5	5	5	5	5
		Employment	156	154	137	144	161	172	176	177	178	181	182	185
		Repl. Rate	.0242	.0248	.0253	.0259	.0265	.0271	.0276	.0276	.0276	.0276	.0276	.0276

Note: Before using values presented in this table see Part III, Section 1, Interpreting the Forecast Results.

WASHINGTON STATE JOB OPPORTUNITIES FORECAST - THIRD EDITION

SECTION 1: VOCATIONAL EDUCATION PROGRAMS
FIELD 17.00.00 TRADE AND INDUSTRIAL OCCUPATIONS

JOF TABLE 24

JUNE, 1977

OE CODE	PROGRAM TITLE/ REFERENCE	DEMAND/ EMPLOYMENT	FISCAL YEARS 1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
17.03.99	Commercial Driving	Total Demand	1,661	900	574	1,726	1,675	1,635	1,617	1,583	1,465	1,333	1,261	1,116
		Expansion	1,014	235	-103	1,018	936	866	818	770	640	499	419	269
		Replacement	647	665	677	708	739	769	799	813	825	834	842	847
		Employment	39,387	39,622	39,519	40,537	41,473	42,339	43,157	43,927	44,567	45,066	45,485	45,754
		Repl. Rate	.0164	.0168	.0171	.0175	.0178	.0182	.0185	.0185	.0185	.0185	.0185	.0185
17.04.01	Aircraft Mechanics	Total Demand	760	272	-419	17	418	509	507	429	384	351	333	250
		Expansion	687	196	-490	-55	340	424	415	333	284	247	226	141
		Replacement	73	76	71	72	78	85	92	96	100	104	107	109
		Employment	5,740	5,936	5,446	5,391	5,731	6,155	6,570	6,903	7,187	7,434	7,660	7,801
		Repl. Rate	.0127	.0129	.0131	.0133	.0135	.0137	.0140	.0140	.0140	.0140	.0140	.0140
17.04.03	Air Traffic Control	Total Demand	46	44	18	20	22	29	38	39	32	31	36	31
		Expansion	36	33	7	9	10	17	25	26	19	17	22	17
		Replacement	10	11	11	11	12	12	13	13	13	14	14	14
		Employment	732	765	772	781	791	808	833	859	878	895	917	934
		Repl. Rate	.0137	.0139	.0142	.0145	.0147	.0150	.0153	.0153	.0153	.0153	.0153	.0153
17.06.00	Office Machine Repair	Total Demand	123	122	81	116	142	145	149	150	145	145	143	146
		Expansion	99	96	53	85	108	108	109	108	101	99	95	96
		Replacement	24	26	28	31	34	37	40	42	44	46	48	50
		Employment	1,494	1,590	1,643	1,728	1,836	1,944	2,053	2,161	2,262	2,361	2,456	2,552
		Repl. Rate	.0159	.0165	.0172	.0178	.0184	.0190	.0196	.0196	.0196	.0196	.0196	.0196
17.07.00	Commercial Art	Total Demand	261	292	180	251	287	286	297	285	276	274	270	272
		Expansion	162	185	69	133	162	154	157	141	128	122	155	113
		Replacement	99	107	111	118	125	132	140	144	148	152	155	159
		Employment	3,836	4,021	4,090	4,223	4,385	4,539	4,696	4,837	4,965	5,087	5,202	5,315
		Repl. Rate	.0259	.0265	.0272	.0279	.0285	.0292	.0298	.0298	.0298	.0298	.0298	.0298
17.07.01	Interior Decoration	Total Demand	167	164	89	179	213	187	201	209	204	180	158	147
		Expansion	71	63	-15	69	96	65	72	77	70	44	21	10
		Replacement	96	101	104	110	117	122	129	132	134	136	137	137
		Employment	2,965	3,028	3,013	3,082	3,178	3,243	3,315	3,392	3,462	3,506	3,527	3,537
		Repl. Rate	.0324	.0335	.0346	.0356	.0367	.0377	.0388	.0388	.0388	.0388	.0388	.0388

Note: Before using values presented in this table see Part III, Section 1, Interpreting the Forecast Results.

JOF TABLE 25

SECTION 1: VOCATIONAL EDUCATION PROGRAMS
FIELD 17.00.00 TRADE AND INDUSTRIAL OCCUPATIONS

JUNE, 1977

OE CODE	PROGRAM TITLE/ REFERENCE	DEMAND/ EMPLOYMENT	FISCAL YEARS 1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
17.07.03	Product/Package Design Technology	Total Demand	12	12	7	12	14	13	14	14	14	14	13	13
		Expansion	9	9	4	8	10	9	10	9	9	9	8	8
		Replacement	3	3	3	4	4	4	4	5	5	5	5	5
		Employment	161	170	174	182	192	201	211	220	229	238	246	254
		Repl. Rate	.0191	.0194	.0197	.0201	.0204	.0208	.0211	.0211	.0211	.0211	.0211	.0211
17.08.00	Commercial Fishing	Total Demand	10	11	1	4	4	4	6	6	5	5	6	5
		Expansion	7	7	-3	0	0	0	2	2	1	1	2	1
		Replacement	3	4	4	4	4	4	4	4	4	4	4	4
		Employment	134	141	138	138	138	138	140	142	143	144	146	147
		Repl. Rate	.0244	.0251	.0258	.0265	.0272	.0279	.0286	.0286	.0286	.0286	.0286	.0286
17.08.02	Marine Maint. & Repair Power Boat Mechanics	Total Demand	31	32	2	11	10	12	19	19	15	14	19	14
		Expansion	21	21	-9	-1	-2	0	6	6	2	1	6	1
		Replacement	10	11	11	12	12	12	13	13	13	13	13	13
		Employment	432	453	444	443	441	441	447	453	455	456	462	463
		Repl. Rate	.0243	.0250	.0257	.0264	.0271	.0278	.0285	.0285	.0285	.0285	.0285	.0285
17.09.00	Photography	Total Demand	68	59	29	51	64	65	68	65	64	61	60	59
		Expansion	46	36	5	26	37	37	38	34	32	29	27	25
		Replacement	22	23	24	25	27	28	30	31	32	32	33	34
		Employment	815	851	856	882	919	956	994	1,028	1,060	1,089	1,116	1,141
		Repl. Rate	.0270	.0275	.0279	.0284	.0289	.0294	.0298	.0298	.0298	.0298	.0298	.0298
17.09.98	Photo-Journalism	Total Demand	79	78	52	74	85	86	88	88	85	84	83	82
		Expansion	51	48	20	40	49	48	48	46	42	40	38	36
		Replacement	28	30	32	34	36	38	40	42	43	44	45	46
		Employment	1,067	1,115	1,135	1,175	1,224	1,272	1,320	1,366	1,408	1,448	1,486	1,522
		Repl. Rate	.0266	.0272	.0279	.0285	.0292	.0298	.0305	.0305	.0305	.0305	.0305	.0305
17.10.01	Carpentry	Total Demand	1,023	878	583	1,305	1,526	1,218	1,314	1,470	1,515	1,223	939	815
		Expansion	495	324	11	695	872	528	586	719	741	435	146	21
		Replacement	528	554	572	610	654	690	728	751	774	788	793	794
		Employment	19,844	20,168	20,179	20,874	21,746	22,274	22,[illegible]0	23,579	24,320	24,755	24,901	24,922
		Repl. Rate	.0266	.0275	.0283	.0292	.0301	.0310	.0318	.0318	.0318	.0318	.0318	.0318

Note: Before using values presented in this table see Part III, Section 1, Interpreting the Forecast Results.

JOF TABLE 25

WASHINGTON STATE JOB OPPORTUNITIES FORECAST - THIRD EDITION

SECTION 1: VOCATIONAL EDUCATION PROGRAMS
FIELD 17.00.00 TRADE AND INDUSTRIAL OCCUPATIONS

JOF TABLE 26

JUNE, 1977

OE CODE	PROGRAM TITLE/ REFERENCE	DEMAND/ EMPLOYMENT	FISCAL YEARS 1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
17.10.03	Heavy Equipment Operation	Total Demand	486	344	220	434	526	544	533	537	523	506	468	432
		Expansion	309	159	30	234	314	319	295	291	270	247	203	163
		Replacement	177	185	190	200	212	225	238	246	253	259	265	269
		Employment	7,664	7,823	7,853	8,087	8,401	8,720	9,015	9,306	9,576	9,823	10,026	10,189
		Repl. Rate	.0231	.0236	.0242	.0247	.0253	.0258	.0264	.0264	.0264	.0264	.0264	.0264
17.10.04	Masonry	Total Demand	89	78	51	124	150	117	122	140	151	115	81	66
		Expansion	46	33	5	75	97	61	64	85	88	51	16	1
		Replacement	43	45	46	49	53	56	58	51	63	64	65	65
		Employment	1,980	2,013	2,018	2,093	2,190	2,251	2,315	2,400	2,488	2,539	2,555	2,556
		Repl. Rate	.0217	.0223	.0229	.0235	.0241	.0247	.0253	.0253	.0253	.0253	.0253	.0253
17.10.05	Painting and Decorating	Total Demand	209	199	101	224	269	229	248	259	256	219	189	170
		Expansion	81	64	-38	78	114	66	77	84	78	40	9	-9
		Replacement	128	135	139	146	155	163	171	175	178	179	180	179
		Employment	3,836	3,900	3,862	3,940	4,054	4,120	4,197	4,281	4,359	4,399	4,408	4,399
		Repl. Rate	.0334	.0346	.0359	.0371	.0383	.0396	.0408	.0408	.0408	.0408	.0408	.0408
17.10.08	Drywall Installation	Total Demand	36	23	1	82	98	45	55	80	85	40	-2	-19
		Expansion	16	2	-20	61	76	22	32	56	61	15	-26	-43
		Replacement	20	21	21	21	22	23	23	24	24	25	24	24
		Employment	2,186	2,188	2,168	2,229	2,305	2,327	2,359	2,415	2,476	2,491	2,465	2,422
		Repl. Rate	.0093	.0094	.0095	.0096	.0097	.0098	.0099	.0099	.0099	.0099	.0099	.0099
17.10.98	Marine Carpentry	Total Demand	212	216	87	151	150	164	206	210	194	197	228	211
		Expansion	150	148	17	76	71	80	116	116	97	97	124	104
		Replacement	62	68	70	75	79	84	90	94	97	100	104	107
		Employment	2,394	2,542	2,559	2,635	2,706	2,786	2,902	3,018	3,115	3,212	3,336	3,440
		Repl. Rate	.0257	.0266	.0275	.0284	.0293	.0303	.0312	.0312	.0312	.0312	.0312	.0312
17.10.99	Industrial Maintenance Technology	Total Demand	324	165	155	330	368	360	345	349	336	319	290	254
		Expansion	173	10	-4	162	191	173	149	148	131	111	79	42
		Replacement	151	155	159	168	177	187	196	201	205	208	211	212
		Employment	5,579	5,589	5,585	5,747	5,938	6,111	6,260	6,408	6,539	6,650	6,729	6,771
		Repl. Rate	.0270	.0277	.0285	.0292	.0299	.0306	.0313	.0313	.0313	.0313	.0313	.0313

Note: Before using values presented in this table see Part III, Section 1, Interpreting the Forecast Results.

JOF TABLE 26

WASHINGTON STATE JOB OPPORTUNITIES FORECAST - THIRD EDITION

JOF TABLE 27

SECTION 1: VOCATIONAL EDUCATION PROGRAMS
FIELD 17.00.00 TRADE AND INDUSTRIAL OCCUPATIONS

JUNE, 1977

OE CODE	PROGRAM TITLE/ REFERENCE	DEMAND/ EMPLOYMENT	FISCAL YEARS 1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
17.11.00	Custodial Services	Total Demand	1,350	1,598	1,219	1,458	1,590	1,606	1,654	1,619	1,583	1,597	1,601	1,620
		Expansion	588	781	365	557	637	601	596	533	473	462	443	439
		Replacement	762	817	854	901	953	1005	1058	1086	1110	1135	1158	1181
		Employment	16,586	17,367	17,732	18,289	18,926	19,527	20,123	20,656	21,129	21,591	22,034	22,473
		Repl. Rate	.0460	.0471	.0482	.0493	.0504	.0515	.0526	.0526	.0526	.0526	.0526	.0526
17.12.00	Diesel and Heavy Equipment Mechanics	Total Demand	1,126	629	559	1,246	1,436	1,307	1,307	1,425	1,429	1,254	1,045	911
		Expansion	751	240	158	819	979	823	795	893	877	687	467	326
		Replacement	375	389	401	427	457	484	512	532	552	567	578	585
		Employment	19,117	19,357	19,515	20,334	21,313	22,136	22,931	23,824	24,701	25,388	25,855	26,181
		Repl. Rate	.0196	.0201	.0205	.0210	.0214	.0219	.0223	.0223	.0223	.0223	.0223	.0223
17.13.00	Drafting	Total Demand	211	173	39	142	214	216	218	215	207	200	190	177
		Expansion	179	139	4	105	175	174	173	167	157	148	136	122
		Replacement	32	34	35	37	39	42	45	48	50	52	54	55
		Employment	2,587	2,726	2,730	2,835	3,010	3,184	3,357	3,524	3,681	3,829	3,965	4,087
		Repl. Rate	.0123	.0125	.0127	.0129	.0131	.0133	.0135	.0135	.0135	.0135	.0135	.0135
17.13.02	Technical Illustration	Total Demand	120	109	39	92	125	125	128	125	120	118	113	109
		Expansion	95	82	11	62	93	91	92	87	81	77	71	66
		Replacement	25	27	28	30	32	34	36	38	39	41	42	43
		Employment	1,570	1,652	1,663	1,725	1,818	1,909	2,001	2,080	2,169	2,246	2,317	2,383
		Repl. Rate	.0162	.0165	.0168	.0172	.0175	.0178	.0181	.0181	.0181	.0181	.0181	.0181
17.14.01	Industrial Electricity	Total Demand	515	452	66	420	564	534	562	588	528	463	429	391
		Expansion	356	285	-104	242	375	335	352	371	306	236	199	158
		Replacement	159	167	170	178	189	199	210	217	222	227	230	233
		Employment	10,331	10,616	10,512	10,754	11,129	11,464	11,816	12,187	12,493	12,729	12,928	13,086
		Repl. Rate	.0153	.0158	.0162	.0166	.0170	.0174	.0178	.0178	.0178	.0178	.0178	.0178
17.15.02	Audiovisual Equipment Repair	Total Demand	22	27	16	21	22	21	20	19	18	16	16	16
		Expansion	6	11	0	4	5	4	3	1	0	-1	-1	-1
		Replacement	16	16	16	17	17	17	17	18	18	17	17	17
		Employment	357	368	368	372	377	381	384	385	385	384	383	382
		Repl. Rate	.0441	.0443	.0446	.0448	.0450	.0453	.0455	.0455	.0455	.0455	.0455	.0455

Note: Before using values presented in this table see Part III, Section 1, Interpreting the Forecast Results.

WASHINGTON STATE JOB OPPORTUNITIES FORECAST - THIRD EDITION

JOF TABLE 28

SECTION 1: VOCATIONAL EDUCATION PROGRAMS
FIELD 17.00.00 TRADE AND INDUSTRIAL OCCUPATIONS

JUNE, 1977

OE CODE	PROGRAM TITLE/ REFERENCE	DEMAND/ EMPLOYMENT	FISCAL YEARS 1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
17.16.01	Drycleaning	Total Demand	218	282	187	220	235	226	226	210	198	198	195	195
		Expansion	77	134	36	65	75	62	58	40	27	26	22	21
		Replacement	141	148	151	155	160	164	168	170	171	172	173	174
		Employment	3,479	3,613	3,649	3,714	3,789	3,851	3,909	3,949	3,976	4,002	4,024	4,045
		Repl. Rate	.0406	.0410	.0414	.0418	.0423	.0427	.0431	.0431	.0431	.0431	.0431	.0431
17.19.00	Graphic Arts/ Printing	Total Demand	249	180	108	216	237	215	237	210	229	205	178	168
		Expansion	134	61	-13	90	105	79	95	66	83	57	29	19
		Replacement	115	119	121	126	132	136	142	144	146	148	149	149
		Employment	4,447	4,508	4,495	4,585	4,690	4,769	4,864	4,930	5,013	5,070	5,099	5,118
		Repl. Rate	.0259	.0264	.0270	.0275	.0281	.0286	.0291	.0291	.0291	.0291	.0291	.0291
17.19.05	Silkscreen Technology	Total Demand	7	8	6	8	9	9	9	8	10	9	8	9
		Expansion	4	5	3	4	5	5	5	4	5	4	3	4
		Replacement	3	3	3	4	4	4	4	4	5	5	5	5
		Employment	115	120	123	127	132	137	142	[illegible]	151	155	158	162
		Repl. Rate	.0261	.0268	.0275	.0281	.0288	.0295	.0302	.0302	.0302	.0302	.0302	.0302
17.19.98	Visual Communications	Total Demand	25	30	21	28	31	29	31	30	29	29	29	29
		Expansion	14	18	8	14	16	14	15	13	12	12	11	11
		Replacement	11	12	13	14	15	15	16	17	17	17	18	18
		Employment	404	422	430	444	460	474	489	502	514	526	537	548
		Repl. Rate	.0283	.0291	.0299	.0307	.0315	.0323	.0331	.0331	.0331	.0331	.0331	.0331
17.19.99	Media Technology	Total Demand	38	41	21	33	39	39	40	38	37	37	36	36
		Expansion	23	25	5	16	21	20	20	18	16	16	14	14
		Replacement	15	16	16	17	18	19	20	20	21	21	22	22
		Employment	503	528	533	549	570	590	610	628	644	660	674	688
		Repl. Rate	.0290	.0295	.0301	.0306	.0311	.0316	.0321	.0321	.0321	.0321	.0321	.0321
17.20.03	Industrial Radiology	Total Demand	10	15	8	10	11	10	10	9	9	8	9	8
		Expansion	5	9	2	4	5	4	4	2	2	1	2	1
		Replacement	5	6	6	6	6	6	6	7	7	7	7	7
		Employment	217	226	228	232	237	241	245	247	249	250	252	253
		Repl. Rate	.0243	.0247	.0251	.0254	.0258	.0261	.0265	.0265	.0265	.0265	.0265	.0265

Note: Before using values presented in this table see Part III, Section 1, Interpreting the Forecast Results.

WASHINGTON STATE JOB OPPORTUNITIES FORECAST - THIRD EDITION

SECTION 1: VOCATIONAL EDUCATION PROGRAMS
FIELD 17.00.00 TRADE AND INDUSTRIAL OCCUPATIONS

JOF TABLE 29

JUNE, 1977

OE CODE	PROGRAM TITLE/ REFERENCE	DEMAND/ EMPLOYMENT	FISCAL YEARS 1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
17.21.00	Instrument Maintenance & Production	Total Demand	24	23	20	22	24	24	24	24	23	20	20	20
		Expansion	9	7	3	4	5	4	3	3	2	-1	-1	-1
		Replacement	15	16	17	18	19	20	21	21	21	21	21	21
		Employment	329	336	339	343	348	352	355	358	360	359	358	357
		Repl. Rate	.0471	.0490	.0509	.0528	.0547	.0566	.0585	.0585	.0585	.0585	.0585	.0585
17.21.02	Instrument and Watch Repair	Total Demand	24	23	20	22	24	24	24	24	23	20	20	20
		Expansion	9	7	3	4	5	4	3	3	2	-1	-1	-1
		Replacement	15	16	17	18	19	20	21	21	21	21	21	21
		Employment	329	336	339	343	348	352	355	358	360	359	358	357
		Repl. Rate	.0471	.0490	.0509	.0528	.0547	.0566	.0585	.0585	.0585	.0585	.0585	.0585
17.22.00	Marine Engineer	Total Demand	20	22	13	20	22	23	23	22	21	19	18	18
		Expansion	11	12	3	9	11	11	10	9	8	6	5	5
		Replacement	9	10	10	11	11	12	13	13	13	13	13	13
		Employment	423	435	438	447	458	469	479	488	496	502	507	512
		Repl. Rate	.0223	.0230	.0237	.0243	.0250	.0256	.0263	.0263	.0263	.0263	.0263	.0263
17.23.02	Machine Shop	Total Demand	2,284	1,074	4	1,281	2,082	2,283	2,134	2,005	1,909	1,901	1,754	1,471
		Expansion	1,586	352	-717	532	1,286	1,435	1,237	1,081	960	929	762	467
		Replacement	698	722	721	749	796	848	897	924	949	972	992	1,004
		Employment	31,148	31,500	30,783	31,315	32,601	34,036	35,273	36,354	37,314	38,243	39,005	39,472
		Repl. Rate	.0224	.0229	.0234	.0239	.0244	.0249	.0254	.0254	.0254	.0254	.0254	.0254
17.23.05	Sheetmetal	Total Demand	398	268	-92	96	293	334	295	283	267	231	195	159
		Expansion	312	176	-183	2	193	227	181	165	146	108	71	34
		Replacement	86	92	91	94	100	107	114	118	121	123	124	125
		Employment	4,749	4,925	4,742	4,744	4,937	5,164	5,345	5,510	5,650	5,764	5,835	5,869
		Repl. Rate	.0181	.0186	.0192	.0197	.0203	.0208	.0213	.0213	.0213	.0213	.0213	.0213
17.23.06	Welding	Total Demand	775	713	208	600	889	917	870	879	871	849	784	737
		Expansion	562	485	-25	353	622	629	562	557	536	501	426	370
		Replacement	213	228	233	247	267	288	308	322	335	348	358	367
		Employment	9,820	10,305	10,280	10,633	11,255	11,884	12,446	13,002	13,539	14,040	14,466	14,836
		Repl. Rate	.0216	.0222	.0227	.0232	.0237	.0242	.0248	.0248	.0248	.0248	.0248	.0248

Note: Before using values presented in this table see Part III, Section 1, Interpreting the Forecast Results.

JOF TABLE 29

OE CODE	PROGRAM TITLE/ REFERENCE	DEMAND/ EMPLOYMENT	FISCAL YEARS 1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
17.24.00	Materials Testing	Total Demand	69	73	32	53	69	75	76	78	74	73	74	71
		Expansion	44	46	5	24	39	43	42	42	37	35	35	31
		Replacement	25	27	27	29	30	32	34	36	37	38	39	40
		Employment	916	962	967	991	1,030	1,073	1,115	1,157	1,194	1,229	1,264	1,295
		Repl. Rate	.0269	.0276	.0282	.0288	.0295	.0301	.0308	.0308	.0308	.0308	.0308	.0308
17.26.01	Barbering	Total Demand	155	206	128	153	164	154	152	134	118	112	103	97
		Expansion	12	54	-29	-9	-4	-19	-25	-41	-53	-56	-61	-63
		Replacement	143	152	157	162	168	173	177	175	171	168	164	160
		Employment	2,856	2,910	2,881	2,872	2,868	2,849	2,824	2,783	2,730	2,674	2,613	2,550
		Repl. Rate	.0501	.0522	.0544	.0565	.0586	.0607	.0628	.0628	.0628	.0628	.0628	.0628
17.26.02	Cosmetology	Total Demand	695	873	658	759	820	819	841	818	801	818	823	846
		Expansion	370	526	296	380	421	401	404	367	337	340	332	342
		Replacement	325	347	362	379	399	418	437	451	464	478	491	504
		Employment	8,717	9,243	9,539	9,919	10,340	10,741	11,145	11,512	11,849	12,189	12,521	12,863
		Repl. Rate	.0373	.0376	.0379	.0382	.0386	.0389	.0392	.0392	.0392	.0392	.0392	.0392
17.27.00	Thermoplastic Welding and Bonding	Total Demand	21	8	-8	2	11	13	13	12	10	9	9	7
		Expansion	17	4	-12	-2	7	9	8	7	5	4	4	2
		Replacement	4	4	4	4	4	4	5	5	5	5	5	5
		Employment	159	163	151	149	156	165	173	180	185	189	193	195
		Repl. Rate	.0222	.0229	.0236	.0242	.0249	.0255	.0262	.0262	.0262	.0262	.0262	.0262
17.27.02	Plastics Technology	Total Demand	58	32	29	78	80	65	81	68	85	102	72	43
		Expansion	46	19	15	63	63	47	63	47	62	77	46	17
		Replacement	12	13	14	15	17	18	20	21	23	25	26	26
		Employment	561	580	595	658	721	768	829	876	938	1,015	1,061	1,078
		Repl. Rate	.0219	.0223	.0227	.0231	.0236	.0240	.0244	.0244	.0244	.0244	.0244	.0244
17.28.01	Fire Science/ Fireman (Paid)	Total Demand	12	151	-30	16	62	63	46	33	3	0	13	9
		Expansion	-40	97	-84	-38	7	7	-11	-23	-53	-55	-41	-45
		Replacement	52	54	54	54	55	56	57	56	56	55	54	54
		Employment	4,224	4,321	4,237	4,199	4,206	4,213	4,202	4,179	4,126	4,071	4,030	3,985
		Repl. Rate	.0123	.0125	.0127	.0129	.0131	.0133	.0135	.0135	.0135	.0135	.0135	.0135

Note: Before using values presented in this table see Part III, Section 1, Interpreting the Forecast Results.

WASHINGTON STATE JOB OPPORTUNITIES FORECAST - THIRD EDITION

SECTION 1: VOCATIONAL EDUCATION PROGRAMS
FIELD 17.00.00 TRADE AND INDUSTRIAL OCCUPATIONS

JOF TABLE 31

JUNE, 1977

OE CODE	PROGRAM TITLE/ REFERENCE	DEMAND/ EMPLOYMENT	FISCAL YEARS 1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
17.28.02	Administration of Justice	Total Demand	426	692	306	458	575	578	556	526	451	442	468	456
		Expansion	85	332	-62	78	180	167	131	98	22	13	38	25
		Replacement	341	360	368	380	395	411	425	428	429	429	430	431
		Employment	11,865	12,197	12,135	12,213	12,393	12,560	12,691	12,789	12,811	12,824	12,862	12,887
		Repl. Rate	.0288	.0296	.0303	.0311	.0319	.0327	.0335	.0335	.0335	.0335	.0335	.0335
17.29.01	Baker	Total Demand	65	69	50	53	45	58	57	52	41	38	33	28
		Expansion	23	26	6	8	-1	11	10	4	-6	-9	-14	-18
		Replacement	42	43	44	45	46	47	47	48	47	47	47	46
		Employment	1,732	1,758	1,764	1,772	1,771	1,782	1,792	1,796	1,790	1,781	1,767	1,749
		Repl. Rate	.0243	.0246	.0250	.0254	.0257	.0261	.0265	.0265	.0265	.0265	.0265	.0265
17.29.02	Commercial Cooking and Food Management	Total Demand	1,975	2,464	1,930	2,253	2,403	2,599	2,731	2,696	2,611	2,539	2,494	2,591
		Expansion	1,055	1,485	909	1,181	1,276	1,411	1,479	1,396	1,268	1,156	1,075	1,133
		Replacement	920	979	1,021	1,072	1,127	1,188	1,252	1,300	1,343	1,383	1,419	1,458
		Employment	28,955	30,440	31,349	32,530	33,806	35,217	36,696	38,092	39,360	40,516	41,591	42,724
		Repl. Rate	.0318	.0322	.0326	.0329	.0333	.0337	.0341	.0341	.0341	.0341	.0341	.0341
17.29.03	Meat Cutting	Total Demand	29	23	31	22	9	22	23	23	22	23	25	20
		Expansion	19	13	20	11	-2	11	11	11	10	11	12	7
		Replacement	10	10	11	11	11	11	12	12	12	12	13	13
		Employment	534	547	567	578	576	587	598	609	619	630	642	649
		Repl. Rate	.0186	.0187	.0189	.0191	.0193	.0194	.0196	.0196	.0196	.0196	.0196	.0196
17.29.04	Waiter/ Waitress	Total Demand	1,917	2,443	1,858	2,187	2,329	2,537	2,661	2,603	2,492	2,391	2,320	2,413
		Expansion	1,070	1,543	921	1,204	1,297	1,450	1,517	1,418	1,270	1,136	1,036	1,097
		Replacement	847	900	937	983	1,032	1,087	1,144	1,185	1,222	1,255	1,284	1,316
		Employment	31,597	33,140	34,061	35,265	36,562	38,012	39,529	40,947	42,217	43,353	44,389	45,486
		Repl. Rate	.0268	.0272	.0275	.0279	.0282	.0286	.0289	.0289	.0289	.0289	.0289	.0289
17.31.00	Small Engine Repair/RV Maintenance	Total Demand	53	54	32	49	57	58	58	55	51	49	46	46
		Expansion	29	29	6	22	28	28	26	23	18	16	13	12
		Replacement	24	25	26	27	29	30	32	32	33	33	33	34
		Employment	1,059	1,088	1,094	1,116	1,144	1,172	1,198	1,221	1,239	1,255	1,268	1,280
		Repl. Rate	.0223	.0230	.0237	.0243	.0250	.0256	.0263	.0263	.0263	.0263	.0263	.0263

WASHINGTON STATE JOB OPPORTUNITIES FORECAST - THIRD EDITION

SECTION 1: VOCATIONAL EDUCATION PROGRAMS
FIELD 17.00.00 TRADE AND INDUSTRIAL OCCUPATIONS

JOF TABLE 32

JUNE, 1977

OE CODE	PROGRAM TITLE/ REFERENCE	DEMAND/ EMPLOYMENT	FISCAL YEARS 1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
17.32.01	Electric Power Generation	Total Demand	112	114	35	98	117	115	117	122	104	95	96	93
		Expansion	56	56	-23	39	56	52	52	55	37	27	27	24
		Replacement	56	58	58	59	61	63	65	67	67	68	69	69
		Employment	2,491	2,547	2,524	2,563	2,619	2,671	2,723	2,778	2,815	2,842	2,869	2,893
		Repl. Rate	.0224	.0226	.0229	.0232	.0234	.0237	.0239	.0239	.0239	.0239	.0239	.0239
17.32.02	Waste Water Technology	Total Demand	40	36	17	32	42	43	43	42	41	40	38	36
		Expansion	32	28	9	23	32	33	32	31	29	28	25	23
		Replacement	8	8	8	9	10	10	11	11	12	12	13	13
		Employment	529	557	566	589	621	654	686	717	746	774	799	822
		Repl. Rate	.0146	.0148	.0150	.0152	.0154	.0156	.0158	.0158	.0158	.0158	.0158	.0158
17.33.01	Custom Apparel Design and Construction	Total Demand	214	152	104	207	215	235	223	186	217	216	180	175
		Expansion	81	18	-29	70	74	89	72	34	61	57	20	15
		Replacement	133	134	133	137	141	146	151	152	156	159	160	160
		Employment	2,528	2,546	2,517	2,587	2,661	2,750	2,822	2,856	2,917	2,974	2,994	3,009
		Repl. Rate	.0527	.0528	.0529	.0530	.0531	.0532	.0533	.0533	.0533	.0533	.0533	.0533
17.33.02	Tailoring	Total Demand	213	150	103	206	214	233	222	184	215	214	178	174
		Expansion	81	17	-29	70	74	88	73	33	61	57	20	15
		Replacement	132	133	132	136	140	145	149	151	154	157	158	159
		Employment	2,516	2,533	2,504	2,574	2,648	2,736	2,809	2,842	2,903	2,960	2,980	2,995
		Repl. Rate	.0523	.0525	.0526	.0527	.0528	.0530	.0531	.0531	.0531	.0531	.0531	.0531
17.33.99	Power Sewing	Total Demand	297	205	128	278	296	314	300	248	290	294	247	236
		Expansion	134	38	-38	105	116	127	106	52	89	89	40	28
		Replacement	163	167	166	173	180	187	194	196	201	205	207	208
		Employment	3,640	3,678	3,640	3,745	3,861	3,988	4,094	4,146	4,235	4,324	4,364	4,392
		Repl. Rate	.0449	.0453	.0457	.0461	.0466	.0470	.0474	.0474	.0474	.0474	.0474	.0474
17.35.00	Upholstering	Total Demand	65	44	24	44	54	56	57	56	53	51	51	47
		Expansion	36	13	-8	11	19	19	18	16	13	10	10	5
		Replacement	29	31	32	33	35	37	39	40	40	41	41	42
		Employment	794	807	799	810	829	848	866	882	895	905	915	920
		Repl. Rate	.0368	.0382	.0396	.0410	.0424	.0438	.0451	.0451	.0451	.0451	.0451	.0451

Note: Before using values presented in this table see Part III, Section 1, Interpreting the Forecast Results.

WASHINGTON STATE JOB OPPORTUNITIES FORECAST - THIRD EDITION

SECTION 1: VOCATIONAL EDUCATION PROGRAMS
FIELD 17.00.00 TRADE AND INDUSTRIAL OCCUPATIONS

JOF TABLE 33

JUNE, 1977

OE CODE	PROGRAM TITLE/ REFERENCE	DEMAND/ EMPLOYMENT	FISCAL YEARS 1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
17.36.01	Cabinet Making and Millwork	Total Demand	69	28	15	46	56	57	57	55	54	51	47	38
		Expansion	41	-1	-14	15	24	23	21	19	17	14	9	0
		Replacement	28	29	29	31	32	34	36	36	37	37	38	38
		Employment	968	967	953	968	992	1,015	1,036	1,055	1,072	1,086	1,095	1,095
		Repl. Rate	.0291	.0300	.0309	.0317	.0326	.0334	.0343	.0343	.0343	.0343	.0343	.0343
17.99.00	Musical Instrument Service and Repair	Total Demand	11	15	10	12	13	13	13	12	11	11	11	10
		Expansion	2	5	0	1	2	1	1	0	-1	-1	-1	-2
		Replacement	9	10	10	11	11	12	12	12	12	12	12	12
		Employment	166	171	171	172	174	175	176	176	175	174	173	171
		Repl. Rate	.0559	.0582	.0604	.0627	.0649	.0671	.0694	.0694	.0694	.0694	.0694	.0694
	Field Total	Total Demand	20,556	18,590	10,430	19,178	22,759	22,967	23,262	22,925	22,176	20,954	19,581	18,629
		Expansion	11,983	9,570	1,165	9,477	12,509	12,183	11,931	11,272	10,236	8,765	7,186	6,058
		Replacement	8,573	9,020	9,265	9,721	10,250	10,784	11,331	11,653	11,940	12,189	12,395	12,571
		Employment	335,973	345,543	346,708	356,165	368,674	380,857	392,788	404,060	414,296	423,061	430,247	436,305
		Repl. Rate	.0255	.0261	.0267	.0273	.0278	.0283	.0288	.0288	.0288	.0288	.0288	.0288
	Section Total	Total Demand	70,989	69,848	46,448	68,939	78,045	78,640	80,615	79,110	76,266	73,771	71,316	69,796
		Expansion	38,822	35,948	11,498	32,348	39,586	38,315	38,376	35,763	31,922	28,527	25,282	23,017
		Replacement	32,167	33,900	34,950	36,591	38,459	40,325	42,239	43,347	44,344	45,244	46,034	46,779
		Employment	1,106,298	1,142,246	1,153,744	1,186,092	1,225,678	1,273,993	1,302,369	1,338,132	1,370,054	1,398,581	1,423,863	1,446,880
		Repl. Rate	.0291	.0297	.0303	.0309	.0314	.0316	.0324	.0324	.0324	.0324	.0324	.0324

Note: Before using values presented in this table see Part III, Section 1, Interpreting the Forecast Results.

JOF TABLE 33

WASHINGTON STATE JOB OPPORTUNITIES FORECAST - THIRD EDITION

SECTION 2: POTENTIAL/EMERGING VOCATIONAL EDUCATIONAL PROGRAMS

JOF TABLE 34

JUNE, 1977

OE CODE	PROGRAM TITLE/ REFERENCE	DEMAND/ EMPLOYMENT	FISCAL YEARS 1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
04.99.99 X	Salesmen, Nec.	Total Demand	11	13	9	12	13	13	13	13	13	12	12	12
		Expansion	5	6	2	5	5	5	5	5	4	3	3	3
		Replacement	6	7	7	7	8	8	8	8	9	9	9	9
		Employment	159	165	167	172	177	182	187	192	196	199	202	205
		Repl. Rate	.0399	.0406	.0413	.0420	.0426	.0433	.0440	.0440	.0440	.0440	.0440	.0440
07.09.09 X	Morticians	Total Demand	3	5	3	3	3	4	3	3	2	3	2	3
		Expansion	2	4	2	2	2	3	2	2	1	2	1	2
		Replacement	1	1	1	1	1	1	1	1	1	1	1	1
		Employment	73	77	79	81	83	86	88	90	91	93	94	96
		Repl. Rate	.0128	.0128	.0129	.0130	.0131	.0131	.0132	.0132	.0132	.0132	.0132	.0132
14.04.01 X	Telephone Operators	Total Demand	204	267	104	200	223	215	211	203	164	148	147	146
		Expansion	17	76	-85	9	29	19	13	5	-33	-47	-46	-45
		Replacement	187	191	189	191	194	196	198	198	197	195	193	192
		Employment	5,152	5,228	5,143	5,152	5,181	5,200	5,213	5,218	5,185	5,138	5,092	5,046
		Repl. Rate	.0362	.0365	.0368	.0371	.0374	.0377	.0380	.0380	.0380	.0380	.0380	.0380
14.05.01 X	Expediters	Total Demand	103	50	-31	25	70	77	76	69	64	60	59	49
		Expansion	85	31	-50	6	50	56	53	45	40	35	33	23
		Replacement	18	19	19	19	20	21	23	24	24	25	26	26
		Employment	1,055	1,086	1,036	1,042	1,092	1,148	1,201	1,246	1,286	1,321	1,354	1,377
		Repl. Rate	.0175	.0177	.0180	.0182	.0184	.0187	.0189	.0189	.0189	.0189	.0189	.0189
16.06.06 X	Mathematical Technicians	Total Demand	11	7	-6	3	10	11	11	10	9	9	9	7
		Expansion	10	5	-7	2	8	9	9	8	7	7	7	5
		Replacement	1	2	1	1	2	2	2	2	2	2	2	2
		Employment	118	123	116	118	126	135	144	152	159	166	173	178
		Repl. Rate	.0123	.0124	.0125	.0126	.0128	.0129	.0130	.0130	.0130	.0130	.0130	.0130

Note: Before using values presented in this table see Part III, Section 1, Interpreting the Forecast Results.

JOF TABLE 34

WASHINGTON STATE JOB OPPORTUNITIES FORECAST - THIRD EDITION

SECTION 2: POTENTIAL/EMERGING VOCATIONAL EDUCATIONAL PROGRAMS

JOF TABLE 35

JUNE, 1977

OE CODE	PROGRAM TITLE/ REFERENCE	DEMAND/ EMPLOYMENT	FISCAL YEARS 1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
17.08.01 X	Sailors and Deckhands	Total Demand	49	23	14	56	47	49	52	48	45	44	48	42
		Expansion	28	1	-8	32	22	23	24	20	17	15	19	12
		Replacement	21	22	22	24	25	26	28	28	28	29	29	30
		Employment	952	953	945	977	999	1,022	1,046	1,066	1,083	1,098	1,117	1,129
		Repl. Rate	.0223	.0229	.0236	.0243	.0249	.0256	.0263	.0263	.0263	.0263	.0263	.0263
17.08.98 X	Ship Officers	Total Demand	52	35	22	57	51	53	54	52	49	48	50	45
		Expansion	25	7	-6	27	20	20	20	17	14	12	14	9
		Replacement	27	28	28	30	31	33	34	35	35	36	36	36
		Employment	910	917	911	938	958	978	998	1,015	1,029	1,041	1,055	1,064
		Repl. Rate	.0294	.0302	.0311	.0319	.0327	.0335	.0343	.0343	.0343	.0343	.0343	.0343
17.10.06 X	Plasterers	Total Demand	4	3	1	8	11	5	6	8	8	4	1	-2
		Expansion	-2	-3	-5	2	4	-2	-1	1	1	-3	-6	-8
		Replacement	6	6	6	6	7	7	7	7	7	7	7	6
		Employment	210	207	202	204	208	206	205	206	207	204	198	190
		Repl. Rate	.0283	.0291	.0299	.0307	.0315	.0324	.0332	.0332	.0332	.0332	.0332	.0332
17.10.07 X	Plumbers	Total Demand	425	395	215	429	497	437	496	531	528	470	424	376
		Expansion	290	250	65	269	325	254	301	328	317	253	202	150
		Replacement	135	145	150	160	172	183	195	203	211	217	222	226
		Employment	6,297	6,547	6,612	6,881	7,206	7,460	7,761	8,089	8,406	8,659	8,861	9,011
		Repl. Rate	.0215	.0221	.0227	.0233	.0239	.0245	.0251	.0251	.0251	.0251	.0251	.0251
17.10.09 X	Glaziers	Total Demand	38	40	25	40	48	50	49	50	50	43	39	38
		Expansion	26	27	12	26	33	34	32	32	31	24	19	18
		Replacement	12	13	13	14	15	16	17	18	19	19	20	20
		Employment	741	768	780	806	839	873	905	937	968	992	1,011	1,029
		Repl. Rate	.0162	.0167	.0173	.0178	.0183	.0188	.0193	.0193	.0193	.0193	.0193	.0193
17.10.10 X	Roofers	Total Demand	50	44	28	80	96	64	72	90	97	66	36	26
		Expansion	35	28	12	63	77	44	51	68	74	43	13	2
		Replacement	15	16	16	17	19	20	21	22	23	23	23	24
		Employment	1,347	1,375	1,387	1,450	1,527	1,571	1,622	1,690	1,764	1,807	1,820	1,822
		Repl. Rate	.0111	.0114	.0117	.0120	.0123	.0126	.0129	.0129	.0129	.0129	.0129	.0129

Note: Before using values presented in this table see Part III, Section 1, Interpreting the Forecast Results.

JOF TABLE 35

WASHINGTON STATE JOB OPPORTUNITIES FORECAST - THIRD EDITION

SECTION 2: POTENTIAL/EMERGING VOCATIONAL EDUCATIONAL PROGRAMS

JOF TABLE 36

JUNE, 1977

OE CODE	PROGRAM TITLE/ REFERENCE	DEMAND/ EMPLOYMENT	FISCAL YEARS 1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
17.10.87 X	Boilermakers	Total Demand	63	66	26	44	62	69	66	67	65	65	60	57
		Expansion	39	40	-1	15	31	35	30	29	26	25	19	16
		Replacement	24	26	27	29	31	34	36	38	39	40	41	41
		Employment	662	702	701	716	747	782	812	841	867	892	911	927
		Repl. Rate	.0363	.0377	.0391	.0405	.0419	.0433	.0447	.0447	.0447	.0447	.0447	.0447
17.10.88 X	Asbestos Workers	Total Demand	0	0	-1	0	1	0	0	0	0	1	0	0
		Expansion	0	0	-1	0	1	0	0	0	0	1	0	0
		Replacement	0	0	0	0	0	0	0	0	0	0	0	0
		Employment	4	4	3	3	4	4	4	4	4	5	5	5
		Repl. Rate	.0144	.0146	.0148	.0150	.0153	.0155	.0157	.0157	.0157	.0157	.0157	.0157
17.10.95 X	Tile Setters	Total Demand	14	13	5	19	23	15	17	20	20	13	5	3
		Expansion	8	6	-2	12	16	8	10	12	12	5	-3	-5
		Replacement	6	7	7	7	7	7	7	8	8	8	8	8
		Employment	503	509	507	519	535	543	553	565	577	582	579	574
		Repl. Rate	.0127	.0128	.0130	.0131	.0132	.0134	.0135	.0135	.0135	.0135	.0135	.0135
17.10.96 X	Carpet Installers	Total Demand	46	50	33	65	74	65	69	74	75	61	47	46
		Expansion	32	36	18	49	57	47	50	54	54	40	26	24
		Replacement	14	14	15	16	17	18	19	20	21	21	21	22
		Employment	1,145	1,182	1,200	1,249	1,306	1,353	1,403	1,457	1,511	1,551	1,577	1,601
		Repl. Rate	.0120	.0122	.0125	.0128	.0131	.0133	.0136	.0136	.0136	.0136	.0136	.0136
17.14.02 X	Electric Power Linemen	Total Demand	16	22	8	21	23	22	24	26	22	19	20	21
		Expansion	9	15	1	13	15	14	15	16	13	10	10	11
		Replacement	7	7	7	8	8	8	9	9	9	9	10	10
		Employment	420	435	436	449	464	478	493	509	522	532	542	553
		Repl. Rate	.0162	.0165	.0168	.0170	.0173	.0175	.0178	.0178	.0178	.0178	.0178	.0178
17.23.01 X	Metal Molders	Total Demand	48	40	-12	5	46	60	42	38	38	36	30	28
		Expansion	41	33	-19	-2	38	52	33	29	28	26	20	17
		Replacement	7	7	7	7	8	8	9	9	10	10	10	11
		Employment	530	563	544	542	580	632	665	694	722	748	768	785
		Repl. Rate	.0126	.0128	.0129	.0131	.0132	.0134	.0135	.0135	.0135	.0135	.0135	.0135

Note: Before using values presented in this table see Part III, Section 1, Interpreting the Forecast Results.

WASHINGTON STATE JOB OPPORTUNITIES FORECAST - THIRD EDITION

SECTION 2: POTENTIAL/EMERGING VOCATIONAL EDUCATIONAL PROGRAMS

JOF TABLE 37

JUNE, 1977

OE CODE	PROGRAM TITLE/ REFERENCE	DEMAND/ EMPLOYMENT	FISCAL YEARS 1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
17.23.04 X	Assemblers	Total Demand	672	279	-85	393	628	635	654	642	633	626	608	536
		Expansion	552	155	-208	264	487	483	490	468	451	435	409	330
		Replacement	120	124	123	129	141	152	164	174	182	191	199	206
		Employment	6,625	6,780	6,572	6,836	7,323	7,806	8,296	8,764	9,215	9,650	10,059	10,389
		Repl. Rate	.0181	.0184	.0187	.0189	.0192	.0195	.0198	.0198	.0198	.0198	.0198	.0198
17.23.07 X	Tool and Die Makers	Total Demand	22	13	-5	7	18	21	22	20	19	19	17	16
		Expansion	19	9	-9	3	14	16	17	14	13	13	11	9
		Replacement	3	4	4	4	4	5	5	6	6	6	6	7
		Employment	158	167	158	161	175	191	208	222	235	248	259	268
		Repl. Rate	.0221	.0226	.0231	.0235	.0240	.0245	.0250	.0250	.0250	.0250	.0250	.0250
17.23.97 X	Metal Working Trades, Nec.	Total Demand	128	63	-9	41	124	171	127	127	108	107	104	83
		Expansion	101	34	-38	11	92	136	89	87	67	65	60	39
		Replacement	27	29	29	30	32	35	38	40	41	42	44	44
		Employment	1,568	1,602	1,564	1,575	1,667	1,803	1,892	1,979	2,046	2,111	2,171	2,210
		Repl. Rate	.0175	.0179	.0183	.0188	.0192	.0196	.0200	.0200	.0200	.0200	.0200	.0200
17.23.98 X	Shipfitters	Total Demand	33	35	5	15	13	17	24	24	20	19	25	21
		Expansion	23	24	-6	3	1	4	11	10	6	5	11	7
		Replacement	10	11	11	12	12	13	13	14	14	14	14	14
		Employment	417	441	435	438	439	443	454	464	470	475	486	493
		Repl. Rate	.0251	.0257	.0264	.0271	.0277	.0284	.0291	.0291	.0291	.0291	.0291	.0291
17.23.99 X	Filers and Polishers	Total Demand	62	1	-13	27	49	53	46	44	42	37	34	26
		Expansion	36	-25	-39	1	21	24	16	14	11	6	3	-5
		Replacement	26	26	26	26	28	29	30	30	31	31	31	31
		Employment	1,108	1,083	1,044	1,045	1,066	1,090	1,106	1,120	1,131	1,137	1,140	1,135
		Repl. Rate	.0232	.0239	.0246	.0252	.0259	.0265	.0272	.0272	.0272	.0272	.0272	.0272
17.29.95 X	Butchers	Total Demand	96	107	80	90	86	103	105	99	88	81	74	71
		Expansion	44	52	23	31	25	39	38	31	20	12	5	2
		Replacement	52	55	57	59	61	64	67	68	68	69	69	69
		Employment	2,076	2,128	2,151	2,182	2,207	2,246	2,284	2,315	2,335	2,347	2,352	2,354
		Repl. Rate	.0250	.0257	.0264	.0271	.0278	.0286	.0293	.0293	.0293	.0293	.0293	.0293

Note: Before using values presented in this table see Part III, Section 1, Interpreting the Forecast Results.

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WASHINGTON STATE JOB OPPORTUNITIES FORECAST - THIRD EDITION

SECTION 2: POTENTIAL/EMERGING VOCATIONAL EDUCATIONAL PROGRAMS

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JUNE, 1977

OE CODE	PROGRAM TITLE/ REFERENCE	DEMAND/ EMPLOYMENT	FISCAL YEARS 1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
17.29.99 X	Bottling and Canning Operatives	Total Demand	80	61	82	58	25	60	61	62	57	62	62	53
		Expansion	45	25	44	20	-13	21	21	21	16	20	20	11
		Replacement	35	36	38	38	38	39	40	41	41	42	42	42
		Employment	1,473	1,498	1,542	1,562	1,549	1,570	1,591	1,612	1,628	1,648	1,668	1,679
		Repl. Rate	.0239	.0241	.0243	.0246	.0248	.0251	.0253	.0253	.0253	.0253	.0253	.0253
17.32.00 X	Stationary Engineers and Firemen	Total Demand	155	99	52	131	146	142	134	125	108	101	91	77
		Expansion	45	-13	-61	15	26	19	8	-1	-17	-24	-32	-45
		Replacement	110	112	113	116	120	123	126	126	125	125	123	122
		Employment	3,562	3,549	3,488	3,503	3,529	3,548	3,556	3,555	3,538	3,514	3,482	3,437
		Repl. Rate	.0308	.0316	.0323	.0331	.0339	.0347	.0355	.0355	.0355	.0355	.0355	.0355
17.99.99 X	Checkers, Manufacturing	Total Demand	96	54	3	51	82	92	91	85	86	87	81	70
		Expansion	80	37	-14	33	62	71	68	61	61	60	53	42
		Replacement	16	17	17	18	20	21	23	24	25	27	28	28
		Employment	867	904	890	923	985	1,056	1,125	1,185	1,246	1,306	1,359	1,401
		Repl. Rate	.0189	.0191	.0194	.0196	.0198	.0201	.0203	.0203	.0203	.0203	.0203	.0203
	Section Total	Total Demand	2,481	1,785	553	1,880	2,469	2,503	2,525	2,529	2,410	2,241	2,085	1,850
		Expansion	1,595	860	-380	911	1,448	1,434	1,405	1,376	1,234	1,043	871	623
		Replacement	886	925	933	969	1,021	1,069	1,120	1,153	1,176	1,198	1,214	1,227
		Employment	38,133	38,993	38,613	39,524	40,972	42,406	43,811	45,187	46,421	47,464	48,335	48,958
		Repl. Rate	.0232	.0237	.0242	.0245	.0249	.0252	.0256	.0256	.0256	.0256	.0256	.0256

Note: Before using values presented in this table see Part III, Section 1, Interpreting the Forecast Results.

OE CODE	PROGRAM TITLE/ REFERENCE	DEMAND/ EMPLOYMENT	FISCAL YEARS 1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
99.0102	Agricultural Scientists	Total Demand	17	23	9	12	13	14	16	14	12	10	11	10
		Expansion	8	13	-1	2	2	3	4	2	0	-2	-1	-2
		Replacement	9	10	10	10	11	11	12	12	12	12	12	12
		Employment	493	506	505	507	509	512	516	518	518	516	515	513
		Repl. Rate	.0189	.0195	.0201	.0207	.0213	.0219	.0225	.0225	.0225	.0225	.0225	.0225
99.0200	Architects	Total Demand	144	174	125	154	171	168	178	175	172	174	175	177
		Expansion	101	127	75	100	112	105	111	105	99	98	97	96
		Replacement	43	47	50	54	59	63	67	70	73	76	78	81
		Employment	1,896	2,023	2,098	2,198	2,310	2,415	2,526	2,631	2,730	2,828	2,925	3,021
		Repl. Rate	.0227	.0234	.0240	.0247	.0254	.0260	.0267	.0267	.0267	.0267	.0267	.0267
99.0400	Biological Scientists	Total Demand	24	34	13	18	21	20	22	18	15	15	14	13
		Expansion	10	19	-2	3	5	4	5	1	-2	-2	-2	-3
		Replacement	14	15	15	15	16	16	17	17	17	17	16	16
		Employment	675	694	692	695	700	704	709	710	708	706	704	701
		Repl. Rate	.0208	.0212	.0216	.0221	.0225	.0230	.0234	.0234	.0234	.0234	.0234	.0234
99.0501	Lawyers	Total Demand	417	525	386	460	511	517	535	524	512	523	534	545
		Expansion	253	344	192	251	285	273	274	253	232	235	237	239
		Replacement	164	181	194	209	226	244	261	271	280	288	297	306
		Employment	5,410	5,754	5,946	6,197	6,482	6,755	7,029	7,282	7,514	7,749	7,986	8,225
		Repl. Rate	.0303	.0315	.0326	.0337	.0349	.0361	.0372	.0372	.0372	.0372	.0372	.0372
99.0503	Actuaries	Total Demand	5	4	4	4	6	6	5	5	5	5	5	5
		Expansion	4	3	3	3	4	4	3	3	3	3	3	3
		Replacement	1	1	1	1	2	2	2	2	2	2	2	2
		Employment	112	115	118	121	125	129	132	135	138	141	144	147
		Repl. Rate	.0118	.0120	.0121	.0123	.0125	.0127	.0129	.0129	.0129	.0129	.0129	.0129
99.0802	Elementary School Teachers	Total Demand	909	1,230	692	845	905	822	795	692	617	601	567	551
		Expansion	249	547	5	149	197	106	72	-29	-101	-113	-142	-152
		Replacement	660	683	687	696	708	716	723	721	718	714	709	703
		Employment	18,939	19,486	19,491	19,640	19,837	19,943	20,015	19,986	19,885	19,772	19,630	19,478
		Repl. Rate	.0348	.0350	.0353	.0355	.0357	.0359	.0361	.0361	.0361	.0361	.0361	.0361

Note: Before using values presented in this table see Part III, Section 1, Interpreting the Forecast Results.

OE CODE	PROGRAM TITLE/ REFERENCE	DEMAND/ EMPLOYMENT	FISCAL YEARS 1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
99.0803	Secondary School Teachers	Total Demand	362	618	127	241	269	177	132	31	-47	-76	-120	-148
		Expansion	4	251	-239	-126	-100	-191	-234	-328	-397	-416	-450	-468
		Replacement	358	367	366	367	369	368	366	359	350	340	330	320
		Employment	16,779	17,030	16,791	16,665	16,565	16,374	16,140	15,812	15,415	14,999	14,549	14,081
		Repl. Rate	.0214	.0216	.0218	.0220	.0222	.0225	.0227	.0227	.0227	.0227	.0227	.0227
99.0805	Miscellaneous College and University Teachers	Total Demand	197	350	56	126	143	89	64	3	-43	-58	-84	-101
		Expansion	7	155	-139	-70	-55	-109	-134	-191	-233	-243	-263	-275
		Replacement	190	195	195	196	198	198	198	194	190	185	179	174
		Employment	10,070	10,225	10,086	10,016	9,961	9,852	9,718	9,527	9,294	9,051	8,788	8,513
		Repl. Rate	.0188	.0191	.0194	.0196	.0199	.0201	.0204	.0204	.0204	.0204	.0204	.0204
99.0823	Preschool, Kindergarten	Total Demand	103	146	74	93	101	88	84	71	60	57	52	49
		Expansion	26	66	-6	12	19	5	1	-12	-22	-24	-28	-30
		Replacement	77	80	80	81	82	83	83	83	82	81	80	79
		Employment	2,506	2,572	2,566	2,578	2,597	2,602	2,603	2,591	2,569	2,545	2,517	2,487
		Repl. Rate	.0308	.0310	.0311	.0313	.0315	.0317	.0319	.0319	.0319	.0319	.0319	.0319
99.0827	School Administration, Elementary Secondary	Total Demand	180	244	151	184	200	190	190	173	163	165	161	163
		Expansion	88	146	50	79	91	77	73	55	44	44	39	40
		Replacement	92	98	101	105	109	113	117	118	119	121	122	123
		Employment	3,420	3,566	3,616	3,695	3,786	3,863	3,936	3,991	4,035	4,079	4,118	4,158
		Repl. Rate	.0270	.0274	.0279	.0283	.0287	.0292	.0296	.0296	.0296	.0296	.0296	.0296
99.0828	School Administration, College	Total Demand	57	74	53	62	69	68	69	67	65	67	68	70
		Expansion	39	54	32	40	45	42	42	39	36	37	37	38
		Replacement	18	20	21	22	24	26	27	28	29	30	31	32
		Employment	801	855	887	927	972	1,014	1,056	1,095	1,131	1,168	1,205	1,243
		Repl. Rate	.0227	.0232	.0238	.0243	.0248	.0253	.0258	.0258	.0258	.0258	.0258	.0258
99.0900	Engineers, Others	Total Demand	145	118	24	103	141	139	144	138	130	124	118	108
		Expansion	105	75	-19	58	93	88	90	83	73	66	59	48
		Replacement	40	43	43	45	48	51	54	55	57	58	59	60
		Employment	2,435	2,510	2,491	2,549	2,642	2,730	2,820	2,903	2,976	3,042	3,101	3,149
		Repl. Rate	.0165	.0169	.0173	.0178	.0182	.0186	.0190	.0190	.0190	.0190	.0190	.0190

Note: Before using values presented in this table see Part III, Section 1, Interpreting the Forecast Results.

OE CODE	PROGRAM TITLE/ REFERENCE	DEMAND/ EMPLOYMENT	FISCAL YEARS 1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
99.0902	Engineers, Aero-Astronautic	Total Demand	608	158	-465	-83	279	347	334	260	217	184	161	94
		Expansion	557	105	-513	-130	229	292	275	199	154	120	96	28
		Replacement	51	53	48	47	50	55	59	61	63	64	65	66
		Employment	4,623	4,728	4,215	4,085	4,314	4,606	4,881	5,080	5,234	5,354	5,450	5,478
		Repl. Rate	.0110	.0112	.0114	.0115	.0117	.0118	.0120	.0120	.0120	.0120	.0120	.0120
99.0906	Engineers, Chemical	Total Demand	44	50	5	33	49	39	40	37	35	37	34	31
		Expansion	34	40	-6	22	37	26	27	23	21	23	19	16
		Replacement	10	10	11	11	12	13	13	14	14	14	15	15
		Employment	717	757	751	773	810	836	863	886	907	930	949	965
		Repl. Rate	.0134	.0137	.0141	.0145	.0148	.0151	.0155	.0155	.0155	.0155	.0155	.0155
99.0907	Engineers, Petroleum	Total Demand	2	1	-1	0	0	-1	1	-1	-1	1	-1	-1
		Expansion	2	1	-1	0	0	-1	1	-1	-1	1	-1	-1
		Replacement	0	0	0	0	0	0	0	0	0	0	0	0
		Employment	27	28	27	27	27	26	27	26	25	26	25	24
		Repl. Rate	.0164	.0165	.0167	.0168	.0169	.0170	.0171	.0171	.0171	.0171	.0171	.0171
99.0908	Engineers, Civil	Total Demand	201	190	86	207	256	218	232	247	244	205	172	154
		Expansion	131	116	10	127	171	128	138	150	144	102	68	49
		Replacement	70	74	76	80	85	90	94	97	100	103	104	105
		Employment	3,893	4,009	4,019	4,146	4,317	4,445	4,583	4,733	4,877	4,979	5,047	5,096
		Repl. Rate	.0179	.0184	.0188	.0193	.0197	.0201	.0206	.0206	.0206	.0206	.0206	.0206
99.0909	Engineers, Electrical	Total Demand	326	233	-26	172	279	291	320	314	285	273	278	257
		Expansion	273	177	-83	113	215	222	246	237	205	190	192	168
		Replacement	53	56	57	59	64	69	74	77	80	83	86	89
		Employment	4,023	4,200	4,117	4,230	4,445	4,667	4,913	5,150	5,355	5,545	5,737	5,905
		Repl. Rate	.0131	.0134	.0138	.0141	.0144	.0147	.0150	.0150	.0150	.0150	.0150	.0150
99.0910	Engineers, Mechanical	Total Demand	283	173	-32	119	231	252	254	238	226	221	217	193
		Expansion	236	122	-83	66	173	189	186	167	152	144	138	111
		Replacement	47	51	51	53	58	63	68	71	74	77	79	82
		Employment	2,816	2,938	2,855	2,921	3,094	3,283	3,469	3,636	3,788	3,932	4,070	4,181
		Repl. Rate	.0168	.0173	.0177	.0181	.0186	.0191	.0195	.0195	.0195	.0195	.0195	.0195

Note: Before using values presented in this table see Part III, Section 1, Interpreting the Forecast Results.

OE CODE	PROGRAM TITLE/ REFERENCE	DEMAND/ EMPLOYMENT	FISCAL YEARS 1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
99.0913	Engineers, Industrial	Total Demand	251	103	-115	30	148	167	162	141	123	110	100	75
		Expansion	215	66	-151	-6	110	127	119	97	78	64	53	28
		Replacement	36	37	36	36	38	40	43	44	45	46	47	47
		Employment	2,803	2,869	2,718	2,712	2,822	2,949	3,068	3,165	3,243	3,307	3,360	3,388
		Repl. Rate	.0127	.0129	.0131	.0133	.0135	.0137	.0139	.0139	.0139	.0139	.0139	.0139
99.0914	Engineers, Metallurgical	Total Demand	20	14	-5	6	16	18	15	15	12	13	12	11
		Expansion	17	11	-8	3	13	15	12	12	9	9	8	7
		Replacement	3	3	3	3	3	3	3	3	3	4	4	4
		Employment	248	259	251	254	267	282	294	306	315	324	332	339
		Repl. Rate	.0104	.0105	.0106	.0107	.0108	.0110	.0111	.0111	.0111	.0111	.0111	.0111
99.0918	Engineers, Mining	Total Demand	4	2	0	2	2	3	3	3	1	2	1	2
		Expansion	3	1	-1	1	1	2	2	2	0	1	0	1
		Replacement	1	1	1	1	1	1	1	1	1	1	1	1
		Employment	89	90	89	90	91	93	95	97	97	98	98	99
		Repl. Rate	.0104	.0106	.0109	.0111	.0113	.0115	.0117	.0117	.0117	.0117	.0117	.0117
99.1004	Musicians and Composers	Total Demand	170	221	156	186	200	206	213	204	198	196	195	201
		Expansion	111	158	90	117	128	130	133	122	113	109	105	109
		Replacement	59	63	66	69	72	76	80	82	85	87	90	92
		Employment	2,780	2,938	3,028	3,145	3,273	3,403	3,536	3,658	3,771	3,880	3,985	4,094
		Repl. Rate	.0214	.0216	.0218	.0219	.0221	.0223	.0225	.0225	.0225	.0225	.0225	.0225
99.1007	Actors	Total Demand	6	6	5	6	6	5	6	5	5	7	6	6
		Expansion	4	4	3	4	4	3	4	3	3	4	3	3
		Replacement	2	2	2	2	2	2	2	2	2	3	3	3
		Employment	82	86	89	93	97	100	104	107	110	114	117	120
		Repl. Rate	.0207	.0210	.0213	.0216	.0220	.0223	.0226	.0226	.0226	.0226	.0226	.0226
99.1008	Dancers	Total Demand	14	17	15	17	17	21	20	22	21	21	22	22
		Expansion	9	11	9	10	10	13	12	13	12	11	12	11
		Replacement	5	6	6	7	7	8	8	9	9	11	10	11
		Employment	149	160	169	179	189	202	214	227	239	250	262	273
		Repl. Rate	.0359	.0365	.0372	.0378	.0384	.0390	.0396	.0396	.0396	.0396	.0396	.0396

Note: Before using values presented in this table see Part III, Section 1, Interpreting the Forecast Results.

OE CODE	PROGRAM TITLE/ REFERENCE	DEMAND/ EMPLOYMENT	FISCAL YEARS 1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
99.1204	Dentists	Total Demand	217	268	224	256	282	289	303	302	305	314	323	333
		Expansion	141	182	129	151	166	162	164	155	151	153	155	158
		Replacement	76	86	95	105	116	127	139	147	154	161	168	175
		Employment	2,085	2,267	2,396	2,547	2,713	2,875	3,039	3,194	3,345	3,498	3,653	3,811
		Repl. Rate	.0362	.0378	.0395	.0411	.0427	.0443	.0459	.0459	.0459	.0459	.0459	.0459
99.1206	Physicians, MD Osteopaths	Total Demand	372	476	349	413	453	453	467	453	444	455	461	470
		Expansion	223	313	175	225	251	237	236	214	198	201	200	202
		Replacement	149	163	174	188	202	216	231	239	246	254	261	268
		Employment	4,973	5,286	5,461	5,686	5,937	6,174	6,410	6,624	6,822	7,023	7,223	7,425
		Repl. Rate	.0299	.0309	.0319	.0330	.0340	.0351	.0361	.0361	.0361	.0361	.0361	.0361
99.1209	Optometrists	Total Demand	28	35	29	32	36	37	38	38	37	39	39	41
		Expansion	19	25	18	20	22	22	22	21	20	21	20	21
		Replacement	9	10	11	12	14	15	16	17	17	18	19	20
		Employment	308	333	351	371	393	415	437	458	478	499	519	540
		Repl. Rate	.0304	.0314	.0325	.0335	.0345	.0356	.0366	.0366	.0366	.0366	.0366	.0366
99.1211	Pharmacists	Total Demand	198	252	203	238	255	282	299	296	288	279	273	284
		Expansion	98	143	87	113	121	138	145	136	123	109	99	105
		Replacement	100	109	116	125	134	144	154	160	165	170	174	179
		Employment	2,883	3,026	3,113	3,226	3,347	3,485	3,630	3,766	3,889	3,998	4,097	4,202
		Repl. Rate	.0349	.0361	.0374	.0387	.0400	.0412	.0425	.0425	.0425	.0425	.0425	.0425
99.1216	Podiatrists	Total Demand	11	12	12	12	14	14	14	16	14	15	16	16
		Expansion	4	5	4	4	5	4	4	5	3	4	4	4
		Replacement	7	7	8	8	9	10	10	11	11	11	12	12
		Employment	88	93	97	101	106	110	114	119	122	126	130	134
		Repl. Rate	.0742	.0770	.0798	.0825	.0853	.0881	.0909	.0909	.0909	.0909	.0909	.0909
99.1218	Veterinarians	Total Demand	67	83	66	74	80	83	87	86	85	88	89	93
		Expansion	49	63	44	50	54	54	56	53	51	52	52	54
		Replacement	18	20	22	24	26	29	31	33	34	36	37	39
		Employment	701	764	808	858	912	966	1,022	1,075	1,126	1,178	1,230	1,285
		Repl. Rate	.0255	.0263	.0271	.0279	.0288	.0296	.0304	.0304	.0304	.0304	.0304	.0304

Note: Before using values presented in this table see Part III, Section 1, Interpreting the Forecast Results.

OE CODE	PROGRAM TITLE/ REFERENCE	DEMAND/ EMPLOYMENT	FISCAL YEARS 1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
99.1221	Chiropractors	Total Demand	48	62	51	59	66	69	72	73	73	75	77	80
		Expansion	27	37	24	29	32	32	31	30	28	29	29	30
		Replacement	21	25	27	30	34	37	41	43	45	46	48	50
		Employment	447	484	508	537	569	601	632	662	690	719	748	778
		Repl. Rate	.0481	.0508	.0536	.0563	.0590	.0618	.0645	.0645	.0645	.0645	.0645	.0645
99.1507	Authors	Total Demand	45	36	6	24	37	39	38	35	30	31	29	26
		Expansion	27	17	-13	4	16	17	15	12	7	7	5	2
		Replacement	18	19	19	20	21	22	23	23	23	24	24	24
		Employment	558	575	562	566	582	599	614	626	633	640	645	647
		Repl. Rate	.0320	.0328	.0337	.0345	.0353	.0362	.0370	.0370	.0370	.0370	.0370	.0370
99.1702	Statisticians	Total Demand	16	10	-3	6	12	13	13	11	10	8	8	7
		Expansion	11	5	-8	1	7	7	7	5	4	2	2	1
		Replacement	5	5	5	5	5	6	6	6	6	6	6	6
		Employment	318	323	315	316	323	330	337	342	346	348	350	351
		Repl. Rate	.0160	.0162	.0163	.0165	.0166	.0168	.0169	.0169	.0169	.0169	.0169	.0169
99.1901	Life, Physical Scientists Nec	Total Demand	4	5	3	3	4	4	3	3	3	3	3	2
		Expansion	4	5	3	3	4	4	3	3	3	3	3	2
		Replacement	0	0	0	0	0	0	0	0	0	0	0	0
		Employment	93	98	101	104	108	112	115	118	121	124	127	129
		Repl. Rate	.0026	.0026	.0026	.0025	.0025	.0025	.0025	.0025	.0025	.0025	.0025	.0025
99.1902	Physicists and Astronomers	Total Demand	28	23	11	21	23	23	23	23	24	21	24	21
		Expansion	23	17	5	14	16	15	15	15	15	12	15	12
		Replacement	5	6	6	7	7	8	8	8	9	9	9	9
		Employment	400	417	422	436	452	467	482	497	512	524	539	551
		Repl. Rate	.0137	.0142	.0148	.0153	.0158	.0163	.0168	.0168	.0168	.0168	.0168	.0168
99.1905	Chemists	Total Demand	53	53	16	36	50	50	48	43	40	42	37	34
		Expansion	36	35	-2	17	31	30	27	22	18	20	15	12
		Replacement	17	18	18	19	19	20	21	21	22	22	22	22
		Employment	934	969	967	984	1,015	1,045	1,072	1,094	1,112	1,132	1,147	1,159
		Repl. Rate	.0183	.0185	.0187	.0188	.0190	.0192	.0194	.0194	.0194	.0194	.0194	.0194

Note: Before using values presented in this table see Part III, Section 1, Interpreting the Forecast Results.

WASHINGTON STATE JOB OPPORTUNITIES FORECAST - THIRD EDITION

SECTION 3: PROFESSIONAL EDUCATIONAL PROGRAMS

JOF TABLE 45

JUNE, 1977

OE CODE	PROGRAM TITLE/ REFERENCE	DEMAND/ EMPLOYMENT	FISCAL YEARS 1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
99.1913	Atmospheric, Space Scientists	Total Demand	11	11	7	9	9	11	12	11	10	10	12	11
		Expansion	.7	7	2	4	4	5	6	5	4	4	5	4
		Replacement	4	4	5	5	5	6	6	6	6	6	7	7
		Employment	148	155	157	161	165	170	176	181	185	189	194	198
		Repl. Rate	.0276	.0286	.0296	.0306	.0317	.0327	.0337	.0337	.0337	.0337	.0337	.0337
99.1914	Geologists	Total Demand	9	10	6	8	9	9	9	10	8	8	8	8
		Expansion	6	7	2	4	5	5	5	5	3	3	3	3
		Replacement	3	3	4	4	4	4	4	5	5	5	5	5
		Employment	184	191	193	197	202	207	212	217	220	223	226	229
		Repl. Rate	.0174	.0180	.0186	.0192	.0198	.0204	.0210	.0210	.0210	.0210	.0210	.0210
99.1919	Marine Scientists	Total Demand	2	3	1	3	2	2	3	2	2	2	2	1
		Expansion	1	2	0	2	1	1	2	1	1	1	1	0
		Replacement	1	1	1	1	1	1	1	1	1	1	1	1
		Employment	49	51	51	53	54	55	57	58	59	60	61	61
		Repl. Rate	.0153	.0155	.0157	.0159	.0161	.0163	.0165	.0165	.0165	.0165	.0165	.0165
99.2000	Psychologists	Total Demand	53	70	43	53	59	56	57	53	50	50	50	51
		Expansion	29	44	16	25	30	26	26	21	18	17	17	17
		Replacement	24	26	27	28	29	30	31	32	32	33	33	34
		Employment	945	989	1,005	1,030	1,060	1,086	1,112	1,133	1,151	1,168	1,185	1,202
		Repl. Rate	.0257	.0261	.0266	.0270	.0274	.0278	.0282	.0282	.0282	.0282	.0282	.0282
99.2200	Other Social Scientists	Total Demand	1	2	1	1	1	1	1	1	1	1	1	1
		Expansion	1	2	1	1	1	1	1	1	1	1	1	1
		Replacement	0	0	0	0	0	0	0	0	0	0	0	0
		Employment	19	21	22	23	24	25	26	27	28	29	30	31
		Repl. Rate	.0037	.0037	.0037	.0037	.0037	.0037	.0037	.0037	.0037	.0037	.0037	.0037
99.2204	Economists	Total Demand	88	63	20	58	83	85	87	84	80	78	76	72
		Expansion	68	41	-2	35	58	59	59	55	50	47	44	39
		Replacement	20	22	22	23	25	26	28	29	30	31	32	33
		Employment	1,266	1,307	1,305	1,340	1,398	1,457	1,516	1,571	1,621	1,668	1,712	1,751
		Repl. Rate	.0161	.0165	.0169	.0173	.0177	.0182	.0186	.0186	.0186	.0186	.0186	.0186

Note: Before using values presented in this table see Part III, Section 1, Interpreting the Forecast Results.

WASHINGTON STATE JOB OPPORTUNITIES FORECAST - THIRD EDITION

SECTION 3: PROFESSIONAL EDUCATIONAL PROGRAMS

JOF TABLE 46

JUNE, 1977

OE CODE	PROGRAM TITLE/ REFERENCE	DEMAND/ EMPLOYMENT	FISCAL YEARS 1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
99.2208	Sociologists	Total Demand	4	4	4	4	6	6	5	6	5	5	5	6
		Expansion	2	2	2	2	3	2	2	3	2	2	2	2
		Replacement	2	2	2	2	3	3	3	3	3	3	3	4
		Employment	33	35	37	39	42	44	46	49	51	53	55	57
		Repl. Rate	.0627	.0627	.0627	.0627	.0628	.0628	.0628	.0628	.0628	.0628	.0628	.0628
	Section Total	Total Demand	5,744	6,186	2,386	4,307	5,514	5,389	5,413	4,942	4,536	4,401	4,231	4,044
		Expansion	3,262	3,564	-296	1,532	2,616	2,374	2,288	1,767	1,322	1,149	951	733
		Replacement	2,482	2,622	2,682	2,775	2,898	3,015	3,125	3,175	3,214	3,252	3,280	3,311
		Employment	102,218	105,782	105,486	107,018	109,634	112,008	114,296	116,063	117,385	118,534	119,485	120,218
		Repl. Rate	.0243	.0248	.0254	.0259	.0264	.0269	.0273	.0273	.0273	.0273	.0273	.0273

Section 3 includes only a portion of all professional education programs. This limited forecast is a first step in expanding the Job Opportunities Forecast to cover professional occupations.

Note: Before using values presented in this table see Part III, Section 1, Interpreting the Forecast Results.

WASHINGTON STATE JOB OPPORTUNITIES FORECAST - THIRD EDITION

SECTION 4: FORECAST SUMMARY

JOF TABLE 47 JUNE, 1977

SECTION	DEMAND/ EMPLOYMENT	FISCAL YEARS 1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
1 Vocational Education Programs	Total Demand	70,989	69,848	46,448	68,939	78,045	78,640	80,615	79,110	76,266	73,771	71,316	69,796
	Expansion	38,822	35,948	11,498	32,348	39,586	38,315	38,376	35,763	31,922	28,527	25,282	23,017
	Replacement	32,167	33,900	34,950	36,591	38,459	40,325	42,239	43,347	44,344	45,244	46,034	46,779
	Employment	1,106,298	1,142,246	1,153,744	1,186,092	1,225,678	1,273,993	1,302,369	1,338,132	1,370,054	1,398,581	1,423,863	1,446,880
	Repl. Rate	.0291	.0297	.0303	.0309	.0314	.0316	.0324	.0324	.0324	.0324	.0324	.0324
2 Potential/Emerging Vocational Educational Programs	Total Demand	2,481	1,785	553	1,880	2,469	2,503	2,525	2,529	2,410	2,241	2,085	1,850
	Expansion	1,595	860	-380	911	1,448	1,434	1,405	1,376	1,234	1,043	871	623
	Replacement	886	925	933	969	1,021	1,069	1,120	1,153	1,176	1,198	1,214	1,227
	Employment	38,133	38,993	38,613	39,524	40,972	42,406	43,811	45,187	46,421	47,464	48,335	48,958
	Repl. Rate	.0232	.0237	.0242	.0245	.0249	.0252	.0256	.0256	.0256	.0256	.0256	.0256
3 Professional Educational Programs	Total Demand	5,744	6,186	2,386	4,307	5,514	5,389	5,413	4,942	4,536	4,401	4,231	4,044
	Expansion	3,262	3,564	-296	1,532	2,616	2,374	2,288	1,767	1,322	1,149	951	733
	Replacement	2,482	2,622	2,682	2,775	2,898	3,015	3,125	3,175	3,214	3,252	3,280	3,311
	Employment	102,218	105,782	105,486	107,018	109,634	112,008	114,296	116,063	117,385	118,534	119,485	120,218
	Repl. Rate	.0243	.0248	.0254	.0259	.0264	.0269	.0273	.0273	.0273	.0273	.0273	.0273
Other Occupations (Not included above)	Total Demand	6,941	4,954	2,719	5,952	6,820	6,697	6,756	6,709	6,409	6,019	5,586	5,042
	Expansion	3,809	1,738	-520	2,604	3,341	3,092	3,025	2,896	2,525	2,076	1,598	1,025
	Replacement	3,132	3,216	3,239	3,348	3,479	3,605	3,731	3,813	3,884	3,943	3,988	4,017
	Employment	118,642	120,380	119,860	122,464	125,805	128,897	131,922	134,818	137,343	139,419	141,017	142,042
	Repl. Rate	.0263	.0267	.0270	.0273	.0277	.0280	.0282	.0282	.0282	.0282	.0282	.0282
Total	Total Demand	86,155	82,773	52,106	81,078	92,848	93,229	95,309	93,290	89,621	86,432	83,218	80,732
	Expansion	47,488	42,110	10,302	37,395	46,991	45,215	45,094	41,802	37,003	32,795	28,702	25,398
	Replacement	38,667	40,663	41,804	43,683	45,857	48,014	50,215	51,488	52,618	53,637	54,516	55,334
	Employment	1,365,291	1,407,401	1,417,703	1,455,098	1,502,089	1,547,304	1,592,398	1,634,200	1,671,203	1,703,998	1,732,700	1,758,098
	Repl. Rate	.0283	.0289	.0295	.0300	.0305	.0310	.0315	.0315	.0315	.0315	.0315	.0315

Note: Before using values presented in this table see Part III, Section 1, Interpreting the Forecast Results.

JOF TABLE 47

WASHINGTON STATE JOB OPPORTUNITIES FORECAST - THIRD EDITION

SECTION 5: REFERENCES TO OTHER VOCATIONAL PROGRAMS

OE CODE	PROGRAMS NOT IN FORECAST	OE CODE	FORECAST REFERENCE
01.01.01	Livestock Management	01.01.00	Agricultural Production
01.01.02	Crops Production	01.01.00	Agricultural Production
01.01.04	Farm Management	01.01.00	Agricultural Production
01.01.97	Farm Technology	01.01.00	Agricultural Production
01.02.01	Agricultural Chemicals	01.02.00	Agricultural Business
01.03.99	Agricultural Auto-Tractor Mechanics	01.03.01 17.03.02	Agricultural Mechanics Automotive Mechanics
01.05.02	Floriculture	01.05.00	Environmental Horticulture
01.05.03	Greenhouse Operation and Management	01.05.00	Environmental Horticulture
01.05.04	Landscaping	01.05.00	Environmental Horticulture
01.05.05	Nursery Operation and Management	01.05.00	Environmental Horticulture
01.05.06	Turf Management	01.05.00	Environmental Horticulture
01.06.03	Soils Technology	01.01.00	Agricultural Production
01.06.05	Water Resources	16.01.51	Environmental Technology
01.06.98	Park Ranger	01.06.02	Recreation Technology
01.06.99	Aquatic Specialist	01.06.02	Recreation Technology

Note: Additional references between similar forecast programs are given at close of section.

WASHINGTON STATE JOB OPPORTUNITIES FORECAST - THIRD EDITION

SECTION 5: REFERENCES TO OTHER VOCATIONAL PROGRAMS

OE CODE	PROGRAMS NOT IN FORECAST	OE CODE	FORECAST REFERENCE
04.08.01	General Supervision	04.08.00	Marketing and Sales
04.08.02	Retail Merchandising	04.08.00	Marketing and Sales
04.08.03	Salesmanship	04.08.00	Marketing and Sales
04.08.05	Business Management	04.08.00	Marketing and Sales
04.15.00	Beautyshop Management	17.26.02	Cosmetology
04.18.01	Ski School Instruction	04.18.00	Commercial Recreation
04.18.02	Ski Resort Management	04.18.00	Commercial Recreation
04.18.05	Management for Music in Performance and Industry	04.08.00	Marketing and Sales
04.19.04	Aviation Business	04.19.00	Transportation
07.02.02	Histology	07.02.00	Medical Laboratory Technology
07.09.01	EKG-EEG Technology	07.99.01	Cardio-Pulmonary Technology
07.09.02	Echo-Cardiographic Technology	07.99.01	Cardio-Pulmonary Technology
07.09.09	Dietetic Assisting	07.09.08	Dietetic Technology
09.02.02	Clothing Management, Production and Service	17.33.01	Custom Apparel Design
09.02.03	Food Management, Production and Services Management	17.29.02	Commercial Cooking
09.02.04	Home Furnishings, Equipment and Services	17.07.01	Interior Decoration

WASHINGTON STATE JOB OPPORTUNITIES FORECAST - THIRD EDITION

SECTION 5: REFERENCES TO OTHER VOCATIONAL PROGRAMS

OE CODE	PROGRAMS NOT IN FORECAST	OE CODE	FORECAST REFERENCE
09.02.05	Institution and Home Management and Support Services	17.11.00	Custodial Services
09.02.93	Early Childhood Instructional Aides	09.02.01	Care Guidance of Children
09.02.94	Early Childhood Aides	09.02.01	Care Guidance of Children
14.01.00	Business Technology	01.02.00	Agricultural Business
		04.04.00	Financial Management
		04.07.00	Club and Tavern Management
		04.08.00	Marketing and Sales
		04.08.01	General Supervision
		04.11.00	Hotel, Motel, Restaurant Management
		04.13.00	Insurance Management
		04.17.00	Real Estate
		04.19.04	Aviation Business
		04.99.00	Purchasing Management
		14.01.01	Accounting
		14.01.02	Bookkeeping
		14.02.00	Data Processing
		14.08.05	Business Management
14.01.02	Bookkeeping	14.01.01	Accounting
14.01.99	Federal Tax Practices	14.01.01	Accounting
		14.01.02	Bookkeeping

Note: Additional references between similar forecast programs are given at close of section.

SECTION 5: REFERENCES TO OTHER VOCATIONAL PROGRAMS

OE CODE	PROGRAMS NOT IN FORECAST	OE CODE	FORECAST REFERENCE
14.04.06	Receptionist Clerk	14.07.00	Secretarial Science
		14.07.02	Medical Secretary
		14.07.03	Stenographer
		14.07.95	Insurance Secretary
		14.07.96	Real Estate Secretary
		14.07.98	Legal Secretary
14.04.95	Hospital Ward Clerk	14.04.97	Medical Records Technology
14.07.85	Machine Shorthand	14.07.00	Secretarial Science
14.07.90	Banking and Finance Clerk	14.07.00	Secretarial Science
14.07.91	Filing and Office Machine Operator	14.07.00	Secretarial Science
14.07.92	Medical Reception	14.07.00	Secretarial Science
14.07.93	Secretarial Home Arts	14.07.00	Secretarial Science
14.07.94	Word Processing Secretary	14.07.00	Secretarial Science
		14.07.02	Medical Secretary
		14.07.03	Stenographer
		14.07.95	Insurance Secretary
		14.07.96	Real Estate Secretary
		14.07.98	Legal Secretary
14.09.01	Clerk Typist	14.07.00	Secretarial Science
		14.07.02	Medical Secretary
		14.07.03	Stenographer
		14.07.95	Insurance Secretary
		14.07.96	Real Estate Secretary
		14.07.98	Legal Secretary

Note: Additional references between similar forecast programs are given at close of section.

WASHINGTON STATE JOB OPPORTUNITIES FORECAST - THIRD EDITION

SECTION 5: REFERENCES TO OTHER VOCATIONAL PROGRAMS

OE CODE	PROGRAMS NOT IN FORECAST	OE CODE	FORECAST REFERENCE
16.01.12	Instrumentation Technology	17.21.02	Instrument and Watch
16.01.17	Scientific Data Processing	14.02.00	Data Processing
16.01.53	Traffic Engineering Technology	16.01.06	Civil Engineering Technology
16.01.55	Highway Engineering Technology	16.01.06	Civil Engineering Technology
17.04.02	Aircraft Operations	16.06.01	Commercial Pilot
17.04.98	Aviation/Airframe Mechanics	17.04.01	Aircraft Mechanics
17.04.99	Aviation/Power Plan Mechanics	17.04.01	Aircraft Mechanics
17.09.01	Photographic Laboratory Technology	17.09.00	Photography
17.09.98	Commercial Photographic Technology	17.09.00	Photography
17.10.00	Building Trades (Secondary)	17.10.01 17.10.04 17.10.05 17.10.08	Carpentry Masonry Painting and Decorating Drywall Installation Also see Section Two Programs
17.10.89	Pile Driver Operation (Construction)		No Reference Available
17.10.92	Fluid Power Drafting	17.13.00	Drafting
17.10.93	Electro-Fluid Power Specialist	17.99.01	Fluid Power Technology

Note: Additional references between similar forecast programs are given at close of section.

WASHINGTON STATE JOB OPPORTUNITIES FORECAST - THIRD EDITION

SECTION 5: REFERENCES TO OTHER VOCATIONAL PROGRAMS

OE CODE	PROGRAMS NOT IN FORECAST	OE CODE	FORECAST REFERENCE
17.12.01	Materials Handling Equipment Mechanics	17.12.00	Diesel, Heavy Equipment
17.13.01	General Design and Drafting	17.13.00	Drafting
17.13.03	Mechanical Drafting	17.13.00	Drafting
17.13.04	Architectural Drafting	17.13.00	Drafting
17.15.01	Communications Electronics	16.01.95 16.01.97 16.01.98	Communications Electronics Aviation Electronics Electronic Technology
17.15.03	Radio/TV Repair	16.01.08	Electronic Technology
17.15.98	Biomedical Equipment Maintenance and Repair	16.01.96	Biomedical Equipment Maintenance and Repair
17.15.99	Electronics Occupations, Other	16.01.08	Electronic Technology
17.28.95	Police Records Technology	17.28.02	Administration of Justice
17.28.96	Security	17.28.02	Administration of Justice
17.28.97	Corrections	17.28.02	Administration of Justice
17.28.98	Law Enforcement	17.28.02	Administration of Justice
17.28.99	Occupational Safety and Health Technology	14.06.00	Personnel and Labor Relations

Note: Additional references between similar forecast programs are given at close of section.

WASHINGTON STATE JOB OPPORTUNITIES FORECAST - THIRD EDITION

SECTION 5: REFERENCES TO OTHER VOCATIONAL PROGRAMS

OE CODE	PROGRAMS NOT IN FORECAST	OE CODE	FORECAST REFERENCE
17.29.98	Buffet Cooking	17.29.02	Commercial Cooking
17.29.99	Quantity Food Preparation/Cooking	17.29.02	Commercial Cooking
17.30.00	Refrigeration	17.01.00	Commercial Refrigeration/ Air Conditioning Maintenance
17.32.99	Water Treatment Technology	16.01.51	Environmental Technology
17.33.00	Clothing Management, Production and Services	17.33.01	Custom Apparel
17.33.97	Power Sewing Machine Operation	17.33.99	Power Sewing
17.33.98	Power Sewing Machine Repair	17.33.99	Power Sewing
17.99.01	Fluid Power Technology	17.12.00	Diesel, Heavy Equipment

Note: Additional references between similar forecast programs are given at close of section.

SECTION 5: REFERENCES TO OTHER VOCATIONAL PROGRAMS
Additional References between Programs in the Forecast

OE CODE	FORECAST PROGRAM	OE CODE	FORECAST REFERENCES
01.07.00	Industrial Forestry	16.06.03	Forestry Technology
04.07.00	Club and Tavern Management	17.29.02	Commercial Cooking
16.01.07	Electrical Power Technology	16.01.09	Electromechanical Technology
16.01.08	Electronic Technology	16.01.09	Electromechanical Technology
16.01.09	Electromechanical Technology	16.01.07 16.01.08	Electrical Power Technology Electronic Technology
16.01.95	Communications Electronics	16.01.97 16.01.98	Industrial Electronics Aviation Electronics
16.01.97	Industrial Electronics	16.01.95 16.01.98	Communication Electronics Aviation Electronics
16.01.98	Aviation Electronics	16.01.95 16.01.97	Communication Electronics Industrial Electronics
16.01.99	Marine Technology	16.06.04	Marine Science Technology
16.06.03	Forestry Technology	01.07.00	Industrial Forestry
16.06.04	Marine Science Technology	16.01.99	Marine Technology
17.07.01	Interior Decoration	17.10.05	Painting and Decorating
17.08.02	Marine Maintenance and Repair Power Boat Mechanics	17.10.98	Marine Carpentry

WASHINGTON STATE JOB OPPORTUNITIES FORECAST - THIRD EDITION

SECTION 5: REFERENCES TO OTHER VOCATIONAL PROGRAMS
Additional References between Programs in the Forecast

OE CODE	FORECAST PROGRAM	OE CODE	FORECAST REFERENCES
17.09.00	Photography	17.09.99	Photo-Journalism
17.09.99	Photo-Journalism	17.09.00	Photography
17.10.03	Heavy Equipment Operation	17.03.99	Commercial Driving
17.10.05	Painting and Decorating	17.07.01	Interior Decoration
17.10.98	Marine Carpentry	17.08.00 17.08.02	Commercial Fishing Marine Maintenance
17.13.00	Drafting	17.13.02	Technical Illustration
17.13.02	Technical Illustration	17.13.00	Drafting
17.19.00	Graphic Arts/Printing	17.19.98 17.19.99	Visual Communication Media Technician
17.19.98	Visual Communications	17.19.00 17.19.99	Graphic Arts/Printing Media Technology
17.19.99	Media Technology	17.19.00 17.19.98	Graphic Arts/Printing Visual Communications
17.21.00	Instrument Maintenance and Production	17.21.02	Instrument and Watch Repair
17.21.02	Instrument and Watch Repair	17.21.00	Instrument Maintenance and Production
17.33.02	Tailoring	17.33.99	Power Sewing
17.33.99	Power Sewing	17.33.02	Tailoring

The Appendix presents additional information helpful in understanding the Job Opportunities Forecast. The economic outlook used by the Washington State Department of Revenue to develop the Long Term Employment Forecast is presented.

Also in the Appendix is a comprehensive report of occupational trends prepared by the Washington State Employment Security Department. This report, included in its entirety, is based upon an economic outlook slightly less optimistic than that used for the Job Opportunities Forecast. Also, it uses the occupational categories of the U. S. Census, as adapted by the Bureau of Labor Statistics. Therefore, comparison with the JOF can be misleading without first consulting the correspondence used between the Census and the educational programs presented in the *Technical Report*. However, the ES report is carefully prepared and thoroughly analyzed, making a valuable supplement that should be consulted by users of the Job Opportunities Forecast.

The Appendix concludes with a glossary of terms used in the main body of the report and a bibliography.

APPENDIX

LONG TERM EMPLOYMENT FORECAST

STATE OF WASHINGTON

1977-1990

THE ECONOMIC OUTLOOK

PREPARED BY

WASHINGTON STATE DEPARTMENT OF REVENUE RESEARCH AND INFORMATION

JUNE, 1977

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This employment forecast has been prepared for use in occupational demand forecasting and reflects long-term trends in selected industry sectors with short-term cyclical fluctuations ignored. The occupational demand forecasts are then incorporated in providing course offerings to students to meet expected demand for specific skills. Thus, the use of long-term trends rather than incorporating short-term cyclical fluctuations lends itself to more stable educational services.

The underlying forces behind this employment forecast strongly affect the overall state economic outlook which are also reflected in the outlook for each sector. Basically, three significant events will be operating over the forecast period: 1) the labor force will be going through a change from rapid growth to slow growth, 2) increased investment and capital equipment purchases will be pushing manufacturing employment up, and 3) therfore, nonmanufacturing sectors with lower wage rates and presently with more part-time employment will show less growth than experienced in recent years. Thus, these separate forces produce a distinct cycle for strong employment growth over the remainder of the 1970's, a fairly rapid slow down in employment expansion during the first half of the 1980's and then a return to more normal growth over the last half of the next decade.

Population projections prepared by OFM, Population Studies Division have been used in the preparation of this employment forecast. Specific comments on the national and state economic outlook follow.

National Economic Outlook

1. The general trend in the national economy is expected to be strong growth through 1980 on account of business and utility investments coupled with strong consumer spending. The trend is anticipated to slow down somewhat in the early 1980's with smaller gains in personal income affecting consumer spending. Growth in the national economy will be slower yet in the latter half of the 1980's with completion of investment for added production capacity, energy and pollution controls.

2. New labor market entrants from the past-war baby boom will taper off during 1980 to 1985, relieving some labor market pressure at that time. Contributing to the slowing labor force growth will be a slow down in the rate of increases of female labor force participation rates which thus far have risen at very sharp rates during the 1970's.

3. Gains in employment will be greater than labor force gains during the remainder of the 1970's and then this difference will start to narrow during the 1980's. The unemployment rate will slowly decline for the remainder of this decade and then stabilize during the 1980's.

4. Because of the continual trend toward fewer working hours per week, personal income is expected to grow at a slower rate than employment growth alone would indicate.

5. Energy and commodity problems are expected to continue albeit at a less serious degree. Toward the end of the forecast period, energy availability will become less of a concern in regard to possibly limiting growth. This assumption is based on conservation and price effects reducing demand and new energy production capability following a decade of heavy investment.

6. Inflation is assumed to be nondisruptive to national economic trends with federal fiscal, monetary, income and other policies maintaining the economy on generally stable growth rates.

7. Housing is expected to provide momentum through 1985 as post-war baby boom cohorts enter the prime home buying ages. Housing needs after 1985 are expected to decline slightly but stabilize.

8. Continuation of current consumption patterns of families is assumed with perhaps slight changes. No major war or change in the current economic order is expected during the forecast period.

State Economic Outlook

1. The structure of the state economy is expected to remain pretty much as currently exists with aerospace, lumber and wood products and machinery industries dominating the manufacturing sector. Agriculture and other resource industries should remain strong and because of the geographical location of the state, military/defense activities will continue to be an important sector in the state.

2. The ratio of nonmanufacturing employment to manufacturing employment, which is also referred to as the ratio of local employment per export employment, has been continuously rising except for short-term cyclical patterns. Several factors have contributed to this rising employment ratio; shifting demands for more services resulting from higher real family incomes, exporting of business and professional services as well as finance, insurance and real estate activities and general expansion of the state's economy where larger markets make it worthwhile to provide goods and services within the state. The ratio is expected to stay around four on account of the continuation of the trend toward a more service oriented economy and strong construction activities will be offset by the strong manufacturing employment outlook.

3. Labor force participation and employment participation by population ages 18 to 64 are expected to show gradual increases through 1985 and then stabilize. From 1967 to 1976, the labor force participation rate of the working age population increased 4.8 percentage points from 69.8 to 74.6 percent. The labor force participation rate is expected to gain another 1.7 percentage points by the end of the forecast period. The employment participation rate of the same working age population has increased by close to two percentage points in the past decade and is expected to gain over two percentage points by the end of the forecast period.

4. Outlook for Selected Industries
   a. The aerospace industry is expected to fare well with new generations of airplanes introduced in the late 1970's and early 1980's. The main production of these new planes is anticipated to be completed by the mid-1980 resulting in a slight reduction of employment but still at a historically high employment level in the second half of the 1980's.
   b. Lumber and wood products employment should be strong with healthy housing demands and construction throughout the forecast period. The impact of heavy investment during the first half of the 1980's produces a minor employment decline in the second half of the decade. Improvements

in labor productivity and efficiency in log processing contribute to the reduced demand for employment.

c. The capital investment boom by manufacturing industries and utilities nationally is the main force for employment expansion in machinery - electrical and non-electrical. New machinery manufacturing with international markets, such as for oil and gas drilling and pumping, are expected to locate within Washington.

d. In addition to the strong housing market, the construction of additional nuclear power plants and the U. S. Navy Trident Support Site will provide for strong construction activity over the next decade and more. The peaking of construction employment in mid-1980's coincides with the expected completion dates of major nuclear power plant construction and other known projects.

e. Continuing development of the Alaskan economy and increased international trade volume both are expected to contribute to expanding employment in trade and service in the state but at a slower expansion rate than experienced in the construction stage of the Alaska oil pipeline.

Editor's Note:
On the following page, Table 1 presents Labor Force and Employment by industry in Washington State for calendar years 1975 through 1985. (The forecast for 1986 through 1990 has been omitted.) These figures, by a process of adaptation, became the Economic Forecast used in the third edition of the Job Opportunities Forecast. Adaptation included:

1. Conversion from calendar years to fiscal years.
2. Distribution of government workers into the appropriate industry sectors.
3. Inclusion of specific projections involving agricultural, self-employed, and unpaid family workers into the forecast.
4. Inclusion of actual employment reports for fiscal year 1974.

This conversion process is discussed in detail, and the Economic Forecast used for the data base of the third edition is presented in the Appendix of the *Technical Report*. Total employment presented in Table 1 on the following page and total employment presented in Part IV Section 4 of this report will not agree exactly because of the conversion steps mentioned above.

TABLE 1
LABOR FORCE AND EMPLOYMENT BY INDUSTRY
STATE OF WASHINGTON
(Thousands)

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Civilian Labor Force	1,532.9	1,547.8	1,615.7	1,661.7	1,702.3	1,750.2	1,787.6	1,825.5	1,854.9	1,881.5	1,903.8
Unemployment	146.7	136.9	135.7	136.3	137.9	141.8	143.0	144.2	144.7	146.8	146.6
Percent	9.6	8.8	8.4	8.2	8.1	8.1	8.0	7.9	7.8	7.8	7.7
Total Employment	1,386.2	1,410.9	1,480.0	1,525.4	1,564.4	1,608.4	1,644.6	1,681.3	1,710.2	1,734.7	1,757.2
Wage and Salary Employment	1,209.3	1,234.2	1,280.0	1,325.4	1,364.4	1,408.4	1,444.6	1,481.3	1,510.2	1,534.7	1,557.2
Manufacturing	241.6	243.5	250.9	264.8	274.6	284.9	292.9	301.2	309.2	314.3	317.5
Nondurables	74.7	77.9	78.7	81.3	82.9	84.4	85.6	87.1	89.0	89.2	89.9
Food and Kindred Products	29.0	30.8	29.5	30.0	30.2	30.6	30.8	31.0	31.3	31.6	31.6
Pulp and Paper	16.6	17.5	18.1	18.8	19.1	19.4	19.5	19.8	20.1	20.0	19.8
Apparel	6.2	6.6	6.8	7.2	7.6	7.7	7.9	8.2	8.6	8.4	8.8
Painting	11.4	11.5	11.8	12.1	12.3	12.6	12.8	13.1	13.2	13.3	13.4
Chemicals	6.2	6.0	6.5	6.6	6.7	6.8	6.9	7.0	7.2	7.2	7.3
Petroleum	2.0	1.9	2.0	2.1	2.1	2.2	2.2	2.2	2.3	2.3	2.3
Other Nondurables	3.3	3.7	4.1	4.4	4.8	5.1	5.5	5.9	6.4	6.5	6.7
Durables	166.9	165.5	172.1	183.5	191.8	200.5	207.3	214.1	220.2	225.0	227.6
Lumber and Wood	43.8	46.5	47.7	48.6	48.8	49.6	50.1	50.6	50.9	50.8	50.5
Furniture	3.7	3.5	3.6	3.7	3.8	3.9	4.0	4.1	4.2	4.3	4.3
Stone-Clay-Glass	6.0	6.1	6.4	6.4	6.5	6.5	6.7	6.8	6.8	6.8	6.9
Ferrous and Fabricated Metals	13.6	13.1	12.6	14.5	15.0	15.5	16.0	16.5	16.8	17.0	17.1
Nonferrous Metals	10.9	11.4	11.3	12.8	13.4	14.2	14.7	15.2	15.8	16.2	16.4
Machinery	19.2	19.5	21.7	24.1	26.0	28.7	31.0	33.3	35.8	37.7	39.5
Non-Electrical	12.6	12.2	13.5	15.3	16.6	18.1	19.3	20.7	22.0	23.1	24.0
Electrical	6.6	7.2	8.2	8.8	9.4	10.7	11.7	12.7	13.7	14.6	15.5
Transportation Equipment	65.1	60.3	63.5	67.8	72.6	76.1	78.9	81.5	83.7	85.7	86.3
Aerospace	51.0	45.7	48.2	51.5	55.7	58.4	60.7	62.7	64.1	65.4	65.4
Shipbuilding	9.0	9.4	9.7	9.9	10.2	10.9	11.2	11.7	12.3	12.9	13.4
Other Transportation	5.1	5.2	5.7	6.4	6.7	6.8	6.9	7.1	7.2	7.4	7.5
Other Durables	4.7	5.2	5.5	5.6	5.7	5.8	6.0	6.1	6.2	6.5	6.6
Nonmanufacturing	967.7	990.8	1,029.1	1,060.6	1,089.8	1,123.5	1,151.7	1,180.1	1,201.0	1,220.4	1,239.7
Mining	1.9	2.0	2.2	2.2	2.3	2.4	2.5	2.5	2.6	2.6	2.7
Construction	55.1	55.0	60.7	61.7	62.9	65.0	68.6	71.3	71.1	70.0	68.6
Transportation	46.3	48.1	49.2	50.0	50.8	51.6	52.1	52.6	53.2	53.5	53.6
Communication and Utilities	24.6	25.0	25.9	26.6	27.3	28.1	29.0	29.4	29.9	30.5	31.1
Trade	281.7	291.6	302.9	316.3	329.3	343.6	355.0	366.1	374.7	383.0	392.6
Wholesale	72.5	73.3	76.8	79.8	82.0	84.6	86.6	88.6	90.0	91.3	92.8
Retail	209.1	218.3	226.1	236.5	247.4	259.0	268.4	277.5	284.7	291.7	299.8
Finance-Insurance-Real Estate	66.1	67.9	70.5	72.2	73.6	75.5	77.2	78.7	80.2	81.6	82.8
Services	219.2	228.2	240.1	249.4	258.1	267.2	273.3	281.6	288.0	294.0	300.5
Government	272.7	272.9	277.6	282.2	285.3	290.0	294.1	297.9	301.4	305.2	308.0
State and Local	212.6	212.3	217.2	221.0	223.2	226.0	228.9	231.9	234.6	237.0	239.7
Federal	60.1	60.6	60.5	61.2	62.1	64.0	65.1	66.0	66.8	68.2	68.3

Note: Figures may not total due to rounding.

OCCUPATIONAL TRENDS

WASHINGTON STATE

1974-1985

PREPARED BY: David Bosse
Research and Statistics Branch
Washington State Employment Security Department
With Cooperation of the U.S. Department of Labor,
Bureau of Labor Statistics and
Employment and Training Administration

JUNE 1977

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INTRODUCTION

"Will I become another trained individual for whom there are no job opportunities?"

"Are there job openings available for my skills in another area?"

These questions are being asked by many students and unemployed workers in Washington State each day. The need for information on future occupational requirements has been voiced by Manpower Training and Vocational Education planners. In order to help answer these questions, this publication has been prepared to assist in the task of assessing future occupational demands.

Using the methodology developed by the U.S. Department of Labor, Bureau of Labor Statistics (BLS), projections of 1985 employment and total worker requirements have been made for 377 occupations. The occupational trends published in this report are the end result of these projections. This publication is intended to reduce the uncertainty of the decision maker, be he a student, unemployed worker, or vocational planner.

The occupational projections in this report are for the Washington State labor market. Succeeding volumes of projections for the large standard metropolitan statistical areas of Seattle-Everett, Tacoma and Spokane along with the smaller sub-state labor market areas of Yakima and Richland-Kennewick will be published at a later date.

Economic Assumptions

The occupational employment projections were based on the following assumptions:

1. Total employment will continue to rise through 1985 and the unemployment rate will gradually decline.

2. The federal government will follow a fiscal policy similar to that of recent years, which will encourage continued economic growth.

3. Current social and technological trends will continue and not drastically alter the economy.

4. Energy will become relatively more expensive, but there will not be long-term shortages.

5. No major event, such as war, will alter the industrial structure of the economy.

6. Labor market areas will not be drastically affected by migration.

Limitations of the Data

The occupational employment projections contained in this report are estimates. The numbers given should be considered trends and not absolute values of occupational requirements. Economic forecasting is far from an exact science. The estimating procedures used rely primarily on the continuation of current patterns and past trends. Therefore, these data may best be used as approximations of and guides to future general trends.

PROJECT METHODOLOGY

The 1976 occupational projections program is the third round of occupational projections using the methodology developed by the Bureau of Labor Statistics. This methodology, as outlined in Tomorrow's Manpower Needs 1/, involves the following four general steps:

1. Development of projections of wage and salary employment by industry to 1985,

2. Adjustments to total employment,

3. Development of occupational projections using the industry-occupation employment matrix system,

4. Development of estimates of occupational replacement requirements.

All projections were developed by the Washington State Employment Security Department using the methodology, technical assistance and data processing support supplied by the Bureau of Labor Statistics.

Projecting industry employment

Projecting industry employment was accomplished in two stages. Initial projections were made using multiple regression analysis. State and area labor market analysts then reviewed the projections and made adjustments, where necessary, based on their knowledge of current and probable future developments which could affect an industry's employment.

For the approximately two hundred industry cells projected, the independent variables used were time and, in most instances, were national industry employment corresponding to the local industry being projected. The dependent variable, local industry employment, was derived from historical estimates of private wage and salary employment collected from business and nonprofit establishments through the Current Employment Statistics (CES) survey and from tax data of the Washington State Employment Security Department.

Adjustments to total employment

The projections of wage and salary employment by industry were adjusted to the census concept of one-person one-job by eliminating secondary jobs of multiple job holders and adding an estimate for people on unpaid leave. Both of these adjustments are made using national factors developed by the Bureau of Labor Statistics.

To complete the conversion of wage and salary employment to total employment adjustments were made to include workers who are self-employed, employed as unpaid family workers, and employed by federal, state, and local governments. Estimates for these worker classes were derived by using current national trends and projected changes to 1985.

1/ Tomorrow's Manpower Needs BLS Bulletin, 1606, Vol. I-IV, Supplements 1 and 2. Vol. IV revised (1971), Supplement 3, 1973, Supplement 4 (1974)

Government workers involved in activities unique to government were classified in the public administration industry cell. Government workers involved in activities corresponding to industries in the private sector, such as education, medical services, and construction, were redistributed to those industries.

Projection of occupational employment

The occupational projections were prepared using the industry-occupation matrix approach. The matrix is a table showing the distribution of employment in 377 occupations for 201 industry cells. The system requires three matrices--one for 1970 based on census data, one updated to 1974, and finally a matrix projected to 1985 by applying national change factors. The resulting staffing patterns (ratio of employment in each occupation to the total employment in the industry), were applied to their respective industry employment totals for 1970 and 1974 and the state employment projections for 1985. Occupational employment levels were then computed for 1974 and 1985 by aggregating across industries.

Growth and replacement demand

Estimating the annual average job vacancies due to growth and replacement was the final step in the methodology. The number of job openings due to growth is the difference between the 1974 and 1985 employment levels. Replacement demands are estimates of the average number of workers who will be required to fill vacancies caused by death, retirement, or withdrawals from the labor force for other reasons. Replacement demand does not provide for labor mobility between occupations. 2/

2/ For detail discussion of replacement rates see Tomorrow's Manpower Needs, Supplement No. 4.

Table 1
Employment by Major Occupational Group by Industry, 1974 and 1985
Washington State
(numbers in thousands)

1974

	Total All Occupations	Professional Technical	Managers 2/ Proprietors	Clerical & Sales	Craft Workers	Operatives	Service 3/ Workers	Laborers 4/
Total All Industries	1350.4	211.7	176.3	314.4	187.4	169.2	184.1	107.0
Agriculture 1/	67.9	3.6	25.5	1.5	1.5	2.1	.2	33.5
Construction	84.0	5.8	12.3	6.4	40.9	7.9	.6	10.0
Manufacturing	270.9	33.6	18.3	34.3	69.7	87.5	3.6	23.8
Transp., Comm. & Util.	92.0	7.9	9.5	19.9	20.5	20.9	3.3	9.9
Trade	306.6	9.5	55.0	106.9	28.0	33.6	55.2	18.3
Finance, Ins., Re. Est.	69.4	3.2	16.0	46.3	1.1	.2	1.5	1.0
Services	384.6	133.6	29.7	73.3	19.9	14.9	105.6	7.5
Public Admin.	75.1	14.5	9.8	25.9	5.8	2.1	13.9	3.0

1985

Total All Industries	1609.4	250.8	211.0	393.2	224.7	189.0	228.9	111.7
Agriculture 1/	77.3	6.1	27.2	3.2	3.1	3.7	.3	33.7
Construction	101.0	7.3	13.6	8.1	51.0	8.9	.7	11.4
Manufacturing	296.7	37.5	21.7	37.2	80.8	95.5	2.7	21.4
Transp., Comm. & Util.	100.2	9.3	11.3	22.4	22.9	21.7	3.0	9.6
Trade	392.3	12.7	67.8	135.8	35.5	38.9	80.6	21.1
Finance, Ins., Real Estate	82.4	3.9	20.1	54.3	1.4	.2	1.4	1.1
Services	472.7	156.1	37.9	102.2	23.1	17.0	126.9	9.5
Public Admin.	86.7	17.7	11.0	30.2	6.6	2.7	1[illegible].0	3.4

1/ Includes forestry, fisheries, and mining.
2/ Includes farm owners and managers.
3/ Includes private household workers.
4/ Includes farm laborers.

NOTE: Detail may not add to total due to rounding.

Table 2
Occupational Pattern Within Industry in Percentages, 1974 and 1985
Washington State

1974

	Total All Occupations	Professional Technical	Managers 2/ Proprietors	Clerical & Sales	Craft Workers	Operatives	Service 3/ Workers	Laborers 4/
Total All Industries	100.0	15.7	13.1	23.3	13.9	12.5	13.6	7.9
Agriculture 1/	100.0	5.3	37.6	2.2	2.2	3.1	0.3	49.3
Construction	100.0	6.9	14.6	7.6	48.7	9.4	0.7	11.9
Manufacturing	100.0	12.4	6.8	12.7	25.7	32.3	1.3	8.8
Transp., Comm. & Util.	100.0	8.6	10.3	21.6	22.3	22.7	3.6	10.8
Trade	100.0	3.1	17.9	34.9	9.1	11.0	18.0	6.0
Finance, Ins., Real Estate	100.0	4.6	23.1	66.7	1.6	0.3	2.2	1.4
Services	100.0	34.7	7.7	19.1	5.2	3.9	27.5	2.0
Public Admin.	100.0	19.3	13.0	34.5	7.7	2.8	18.5	4.0

1985

Total All Industries	100.0	15.6	13.1	24.4	14.0	11.7	14.2	6.9
Agriculture 1/	100.0	7.9	35.2	4.1	4.0	4.8	0.4	43.6
Construction	100.0	7.2	13.5	8.0	50.5	8.8	0.7	11.3
Manufacturing	100.0	12.6	7.3	12.5	27.2	32.2	0.9	7.2
Transp., Comm. & Util.	100.0	9.3	11.3	22.4	22.9	21.6	3.0	9.6
Trade	100.0	3.2	17.3	34.6	9.0	9.9	20.5	5.4
Finance, Ins., Real Estate	100.0	4.7	24.4	65.9	1.7	0.2	1.7	1.3
Services	100.0	33.0	8.0	21.6	4.9	3.6	26.8	2.0
Public Admin.	100.0	20.4	12.7	34.8	7.6	3.1	17.3	3.9

1/ Includes forestry, fisheries, and mining.
2/ Includes farm owners and managers.
3/ Includes private household workers.
4/ Includes farm laborers.

NOTE: Detail may not add to 100.0% due to rounding.

CHART 1

WHITE COLLAR WORKER, BLUE COLLAR WORKER, SERVICE WORKER, AND FARM WORKER EMPLOYMENT FOR 1960, 1974, AND 1985
WASHINGTON STATE

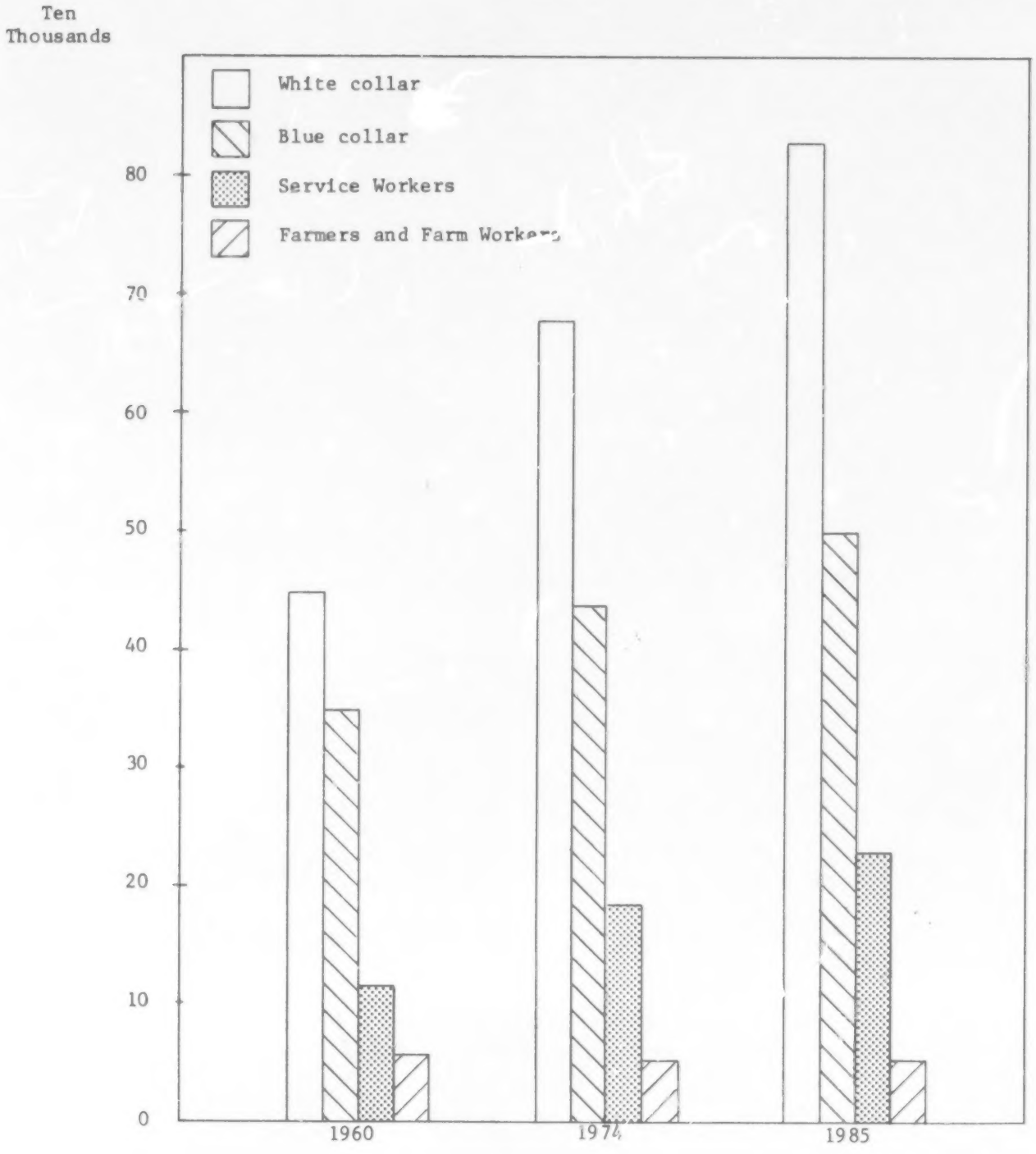

Table 3
Employment by Major Occupational Group, 1974 and 1985
Washington State and United States
(numbers in thousands)

Occupation Group	Washington State Employment				United States Employment 1/			
	1974	Per-cent	1985	Per-cent	1974	Per-cent	1985	Per-cent
TOTAL	1,350	100.0	1,609	100.0	85,936	100.0	103,400	100.0
White Collar Workers	678	50.2	829	51.5	41,739	48.6	53,200	51.5
Blue Collar Workers	437	32.4	499	31.0	29,776	34.6	33,700	32.6
Service Workers	184	13.6	229	14.2	11,373	13.2	14,600	14.1
Farmers and Farm Workers	51	3.8	52	3.2	3,048	3.5	1,900	1.8

Table 4
Employment Change by Major Occupational Group, 1974-1985
Washington State

	1974 Employment	1985 Employment	Percentage Change 1974-1985
White Collar Workers	678,031	829,423	22.3
Professional, Technical	211,743	250,835	18.5
Managers, Officials	151,895	185,399	22.1
Sales Workers	86,229	103,315	19.8
Clerical Workers	228,164	289,874	27.0
Blue Collar Workers	437,352	499,132	14.1
Craft and Kindred Workers	187,400	224,736	19.9
Operatives	169,182	189,000	11.7
Laborers, except farm	80,770	85,396	5.7
Service Workers	184,070	228,934	24.4
Farmers and Farm Workers	50,698	51,897	2.4

1/ Source: Bureau of Labor Statistics

OCCUPATIONAL OUTLOOK

White collar workers will continue to make up the largest portion of employment in Washington State. White collar employment is expected to increase by more than 22 percent between 1974 and 1985. The number of workers in this occupational group will comprise more than 51 percent of the total by 1985. Blue collar workers, which comprise the next largest segment, will grow more slowly. Although the need for blue collar workers will increase 14 percent by 1985, this group will account for a smaller share of total employment in 1985 than in 1974.

Among blue collar workers, the rate of change in different occupations will vary greatly. Employment of craft and kindred workers will expand by nearly 20 percent. Conversely, except for replacements, demand for laborers (nonfarm) between 1974 and 1985 will show almost no change.

The fastest growing occupational group is projected to be service workers. It is anticipated that the number of service workers will increase by nearly one fourth by 1985.

Employment in the farmers and farmworkers occupational group, which is projected to fall noticeably in the United States between 1974-1985, is expected to remain nearly constant over the same period in Washington State. The trend toward automation of farm labor activities will be offset in Washington State by the anticipated increase in irrigated farm acreage resulting from new federally funded water projects.

Projected changes in occupational demand will continue to be related to industrial developments. Among the fastest growing industries will be medical services, business services, legal services and eating and drinking places. Expansion in these industries will increase demand for service workers. Factors involved in this trend include population growth, extended coverage of medical and dental insurance plans, increased use by business and government of research and consulting services, and the expected gain in personal income.

Technological developments, such as mechanization and automation, have a limited effect on service workers but will greatly affect blue collar workers. For example, technological advances which save labor in industries such as printing, transportation, lumber and wood products, and food processing will contribute to the slower growth rate of blue collar workers. As automation and mechanization increase productivity among blue collar workers, the resulting increase in earnings and the standard of living will cause a demand for more services and service workers.

White collar employment will be influenced by sharp rises expected in finance, wholesale and retail trade, state and local public administration, and medical services. In manufacturing industries, the shift from blue collar to white collar workers will continue. The increased need for scientific, technical, clerical, and managerial workers will maintain this trend.

CHART 2

VARYING GROWTH AMONG SELECTED OCCUPATIONS

WASHINGTON STATE

Projected percentage change, 1974 - 1985

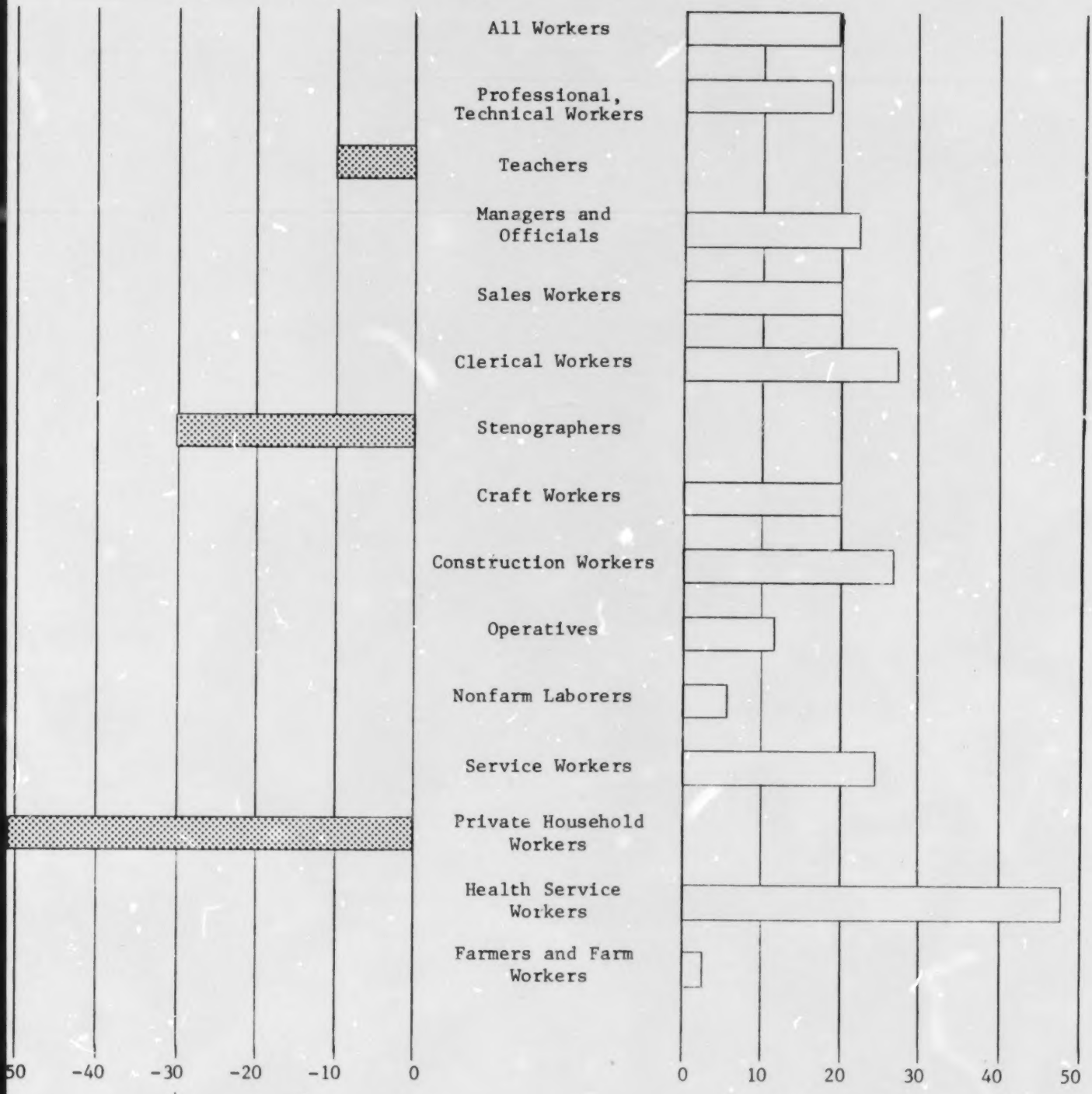

Table 5
SELECTED OCCUPATIONS WITH HIGH PROJECTED GROWTH, 1974-1985
WASHINGTON STATE 1/

Occupations	Total	Average Annual Worker Needs: Growth	Average Annual Worker Needs: Replacement
Agricultural, Biological, tech. except Health	82	41	41
Surveyors	115	80	35
Dentists	224	135	89
Therapists	212	107	105
Veterinarians	68	46	22
Dental Hygienists	139	86	53
Other Health Technicians	157	85	72
Other Technicians, except Health	88	65	23
Writers Artist Entertainers NEC	162	103	59
Architects	139	87	52
Religious, except Clergy	86	36	50
Vocational Education Counselors	232	121	111
School Administrators, College	59	33	26
Secretaries, Legal	338	137	201
Secretaries, Medical	179	62	117
Teachers Aids, except Monitors	339	166	173
Bulldozer Operators	174	119	55
Data Processing Machine Repairers	67	57	10
Office Machine Repairers	81	58	23
Dental Assistants	525	192	333
Practical Nurses	1096	418	678
Child Care Workers, except Pri. Household	837	303	534
Animal Caretakers, except Farm	246	128	118
Farm Managers	91	61	30

1/ Selected on the basis of a 1974 Employment level of 500 or more and a projected growth rate of at least 45 percent.

Table 6
SELECTED OCCUPATIONS PROJECTED TO DECLINE, 1974-1985
WASHINGTON STATE 1/

Occupations	Average Annual Worker Needs		
	Total	Growth	Replacement
Engineers, Aero-Astronautic	32	- 16	48
College and University Teachers	61	-181	242
Elementary School Teachers	953	- 48	1001
Preschool, Kindergarten Teachers	106	- 14	120
Secondary School Teachers	183	-310	493
Newspaper Carriers and Vendors	1	- 26	27
Stenographers	54	- 53	107
Key Punch Operators	106	- 81	187
Telephone Operators	311	- 39	350
Ticket Station Express Agents	65	- 11	76
Auto Body Repairers	24	- 10	34
Compositors and Typesetters	47	- 18	65
Bakers	32	- 15	47
Stationary Engineers	53	- 24	77
Clothing Ironers and Pressers	64	- 17	81
Dressmakers, except Factory	112	- 4	116
Oilers Greasers, except Auto	19	- 8	27
Riveters and Fasteners	9	- 5	14
Furnace Tender Stoker, except Metal	20	- 16	36
Taxicab Drivers, Chauffeurs	32	- 2	34
Barbers	74	- 40	114
Firefighters	32	- 13	45
Guards	240	- 11	251
Child Care Workers, Pri. Household	137	-501	638
Pri. Household Cleaners, Servants	62	-107	169
Fishers, Hunters, Trappers	13	- 35	48
Freight Material Handlers	206	- 7	213
Timbercutting Logging Workers	73	- 51	124
Warehouse Laborers, N.E.C.	73	- 18	91
Other Laborers, N.E.C.	162	- 82	244
Farm Laborers, Wage Workers	452	-149	601

1/ Selected on the basis of a 1974 employment level of 1,200 or more and a negative growth rate.

HIGH AND LOW GROWTH OCCUPATIONS

Job opportunities will vary widely among occupations through the mid-1980's. In assessing the employment potential of an occupation it should be noted that other factors are as important as the growth rate. Some occupations will grow rapidly, but because of a small base the number of job openings may be relatively small. Conversely, other occupations which will experience small increases or declines in employment will still have major worker requirements because of replacement needs. The importance of openings due to replacement should not be overlooked. For instance, employment of nonfarm laborers is projected to grow at only a moderate 6 percent rate. However, replacement demand for these workers is expected to average nearly 2,000 openings each year over the 1974-1985 period.

Professional, Technical, and Kindred

Employment in this category is expected to increase nearly 20 percent by 1985. The fastest growing occupations will be agricultural-biological technicians, surveyors, dentists, and other health technicians. The need for workers in these occupations will increase as society demands better environmental quality, improved health care, and other services which reflect the standard of living.

Certain occupations are expected to decline in employment in this category. Among those occupations which will experience a negative growth rate is secondary school teachers. This drop is anticipated as a result of the low birth rate of the 1960's and 1970's which will cause a smaller teenage population by the mid-1980's. An average of 500 secondary teachers will be needed each year to replace those who leave the labor force. However, because of the negative expansion rate there will be a net demand of only 200 secondary school teachers.

Managers, Officials, Proprietors

Over 8,000 new workers annually will be needed in this occupational group. Nearly 40 percent of the needed workers will fill openings created by growth in employment. The increase expected in retail trade, wholesale trade, finance, and restaurant outlets will require many more managers and officials. A shift from proprietorships to chain store operations in such retail outlets as small grocery stores will increase the demand for professional managers.

Sales Workers

Employment of sales workers will increase 20 percent by 1985. The sharp expansion in employment in the wholesale and retail industries will heighten the need for sales workers. Demand in such occupations as advertising agents, insurance and real estate brokers, and sales clerks will increase as population rises and personal income grows.

Clerical Workers

By 1985 employment of clerical workers will exceed that of any other occupational group. Total job opportunities will average nearly 20,000 a year. The projected growth rate of 27 percent is expected to be nearly 10 percentage points higher than the rate of growth for all

workers. The enlargement of medical services, legal services, and banking will result in higher demand for such clerical occupations as medical secretaries, legal secretaries and bank tellers. However, the continued improvement of labor saving technology and machines will cause employment in some clerical occupations to decline, including stenographers, key punch operators, and telephone operators.

Craft and Kindred Workers

The rate of replacement among craft workers will be lower than for any other occupational group. Only 4,200 workers yearly will be needed to fulfill replacement needs. At the same time, growth in craft occupations will require only 3,400 additional workers. Employment opportunities will vary greatly among the craft worker occupations during the 1974-1985 period. Employment of printing trades craft workers, transportation-public utilities craft workers, and other craft workers is projected to change little. Demand for construction craft workers, mechanics, repairers and installers, and metal craft workers will grow much more rapidly. This demand will result from the recovery from the recession level of the mid-1970's and from continued growth in the construction industry as well as in several manufacturing industries, such as aircraft and parts, shipbuilding, and machinery.

Operatives

Job opportunities for operatives will increase nearly 12 percent over the 1974-1985 period. Over 70 percent of the openings will result from replacement requirements. Because of the extensive number of labor force separations expected in this occupational group, replacement demand will be high for workers such as semiskilled packagers, sorters, assemblers, and transportation equipment operators. Product development and changes in technology will cause employment in many operative occupations to decline. Among these will be clothing ironers and pressers, nonfactory dressmakers, oilers and greasers except auto, and riveters and fasteners.

Service Workers

An average of over 15,000 service workers will be needed each year between 1974-1985. Over 4,000 of these job opportunities will be due to growth. Occupations in cleaning services excluding private household, food services, and health services are expected to grow rapidly. The need for service workers will continue to expand as the standard of living increases. The trend to more and more working families, in which both adult family members have jobs, will increase the demand for service functions. Services workers will also be less affected by labor saving technology than other occupations.

Laborers, Except Farm

Employment of nonfarm laborers will change little by the mid-1980's. Only 400 new job openings will occur each year. Although a large number of replacement workers will be needed, changes in labor saving equipment and machinery will limit growth in these occupations. Examples of jobs in which machinery will continue to be substituted for manual labor include freight material handlers, timbercutting workers, warehouse laborers, and vehicle cleaners.

Farmers and Farm Workers

The total number of farmers and farm workers will show very little change between 1974-1985. Within this occupational group will be several divergent trends. Among farmers and farm managers, the number of individual farm owners will grow only moderately, but employment of farm managers is expected to double. While employment for farm laborer supervisors will increase sharply, there will be a decline of about 150 jobs each year for farm laborers-wage workers. The need for 600 workers annually will still be required to replace farm-laborer wage workers who will leave the labor force.

TABLE 7

Washington State 1974 Employment, Projected 1985 Employment and 1974-1985 Average Annual Worker Needs by Occupation

Occupation	1974 Employment	1985 Employment	Percent Change 1974-1985	AVERAGE ANNUAL WORKER NEEDS 1974-1985 Total	Openings Due To Growth	Openings Due To Replacement
TOTAL LISTED OCCUPATIONS	1,350,151	1,609,386	19.2	77,558	23,567	53,991
Professional, Technical, Kindred	211,743	250,835	18.5	11,033	3,554	7,479
Engineers, Technical	25,303	29,606	17.0	762	391	371
Engineers, Aero-Astronautic	4,676	4,499	- 3.8	32	-16	48
Engineers, Chemical	719	864	20.2	23	13	10
Engineers, Civil	4,785	6,081	27.1	205	118	87
Engineers, Electrical	5,029	6,265	24.6	180	112	68
Engineers, Industrial	2,813	2,925	4.0	46	10	36
Engineers, Mechanical	4,041	5,168	27.9	173	102	71
Engineers, Metallurgical	250	297	18.8	7	4	3
Engineers, Mining	91	95	4.4	1	0	1
Engineers, Petroleum	34	28	-17.6	0	-1	1
Engineers, Sales	444	533	20.0	15	8	7
Engineers, Other	2,421	2,851	17.8	79	39	40
Life and Physical Scientists	3,228	3,549	9.9	100	29	71
Agricultural Scientists	491	493	0.4	10	0	10
Atmospheric, Space Scientists	149	185	24.2	7	3	4
Biological Scientists	667	658	- 1.3	19	-1	20
Chemists	1,165	1,294	11.1	39	12	27
Geologists	184	217	17.9	6	3	3
Marine Scientists	81	97	19.8	2	1	1
Physicists and Astronomers	400	484	21.0	14	8	6
Life, Physical Scientists, nec	91	121	33.0	3	3	0
Mathematical Specialists	522	590	13.0	18	6	12
Actuaries	108	130	20.4	5	2	3
Mathematicians	99	145	46.5	6	4	2
Statisticians	315	315	0	8	0	8
Engineers, Science Technicians	15,962	21,642	35.6	841	516	325
Agri, Biolog Tech exc Health	842	1,291	53.3	82	41	41
Chemical Technicians	868	997	14.9	32	12	20

NOTE: List of Abbreviations at end of Table.

TABLE 7 (Continued)

Occupation	1974 Employment	1985 Employment	Percent Change 1974-1985	AVERAGE ANNUAL WORKER NEEDS 1974-1985 Total	Openings Due To Growth	Openings Due To Replacement
Drafters	4,997	7,042	40.9	279	186	93
Electrical, Electronic Tech	3,116	3,950	26.8	120	76	44
Industrial Engineering Tech	334	396	18.6	12	6	6
Mathematical Tech	25	77	208.0	5	5	0
Mechanical Engineering Tech	120	141	17.5	3	2	1
Surveyors	1,774	2,653	49.5	115	80	35
Engineering, Science Tech, nec	3,886	5,095	31.1	194	110	84
Medical Workers, exc Tech	26,407	34,988	32.5	2,139	780	1,359
Chiropractors	439	721	64.2	50	26	24
Dentists	2,046	3,533	72.7	224	135	89
Dietitians	354	409	14.6	25	5	20
Optometrists	303	500	65.0	29	18	11
Pharmacists	2,890	3,760	30.1	198	79	119
Physicians, MD Osteopaths	4,882	6,889	41.1	342	182	160
Podiatrists	86	124	44.2	10	3	7
Registered Nurses	12,946	14,869	14.9	977	175	802
Therapists	1,745	2,923	67.5	212	107	105
Veterinarians	691	1,199	73.5	68	46	22
Other Medical and Health	22	61	177.3	4	4	0
Health Technol and Tech	5,553	8,225	48.1	575	243	332
Clinical Lab Technol, Tech	2,224	2,667	19.9	161	40	121
Dental Hygienists	469	1,410	200.6	139	86	53
Health Record Technol, Tech	371	593	59.8	50	20	30
Radiologic Technol, Tech	1,066	1,174	10.1	66	10	56
Therapy Assistants	15	33	120.0	3	2	1
Other Health Technol, Tech	1,408	2,348	66.8	157	85	72
Technicians, exc Health	4,778	6,108	27.8	201	121	80
Airplane Pilots	2,022	2,215	9.5	39	18	21
Air Traffic Controllers	684	823	20.3	23	13	10
Embalmers	72	91	26.4	3	2	1
Flight Engineers	359	470	30.9	14	10	4
Radio Operators	678	844	24.5	36	15	21

TABLE 7 (Continued)

Occupation	1974 Employment	1985 Employment	Percent Change 1974-1985	AVERAGE ANNUAL WORKER NEEDS 1974-1985 Total	Openings Due To Growth	Openings Due To Replacement
Tool Programers, Numerical	54	39	-27.8	-1	-1	0
Other Technicians exc Health	909	1,626	78.9	88	65	23
Computer Specialists	4,225	5,643	33.6	201	129	72
Computer Programers	2,572	3,363	30.8	119	72	47
Computer Systems Analysts	1,372	1,901	38.6	69	48	21
Other Computer Specialists	281	379	34.9	13	9	4
Social Scientists	2,534	3,204	26.4	127	61	66
Economists	1,252	1,557	24.4	53	28	25
Political Scientists	*	*	---	*	*	*
Psychologists	929	1,128	21.4	53	18	35
Sociologists	32	55	71.9	4	2	2
Urban and Regional Planners	302	435	44.0	16	12	4
Other Social Scientists	19	29	52.6	1	1	0
Teachers	53,583	48,147	-10.1	1,710	-494	2,204
Adult Education Teachers	844	944	11.8	44	9	35
College and University Teacher	9,883	7,893	-20.1	61	-181	242
Elementary School Teachers	18,588	18,059	- 2.8	953	-48	1,001
Preschool, Kindergarten	2,460	2,306	- 6.3	106	-14	120
Secondary School Teachers	16,468	13,055	-20.7	183	-310	493
Teachers, nec, exc Coll, Univer	5,340	5,890	10.3	362	50	312
Writers, Artists, Entertainers	17,552	23,705	35.1	1,195	559	636
Actors	80	111	38.7	9	3	6
Athletes and Kindred Workers	2,038	2,913	42.9	152	80	72
Authors	554	581	4.9	21	2	19
Dancers	149	245	64.4	30	9	21
Designers	1,598	2,298	43.8	116	64	52
Editors and Reporters	2,055	2,715	32.1	138	60	78
Musicians and Composers	2,749	3,747	36.3	188	91	97
Painters and Sculptors	2,790	3,587	28.6	174	72	102
Photographers	1,406	1,789	27.2	84	35	49
Public Relations Specialist	2,163	2,584	19.5	116	38	78

TABLE 7 (Continued)

Occupation	1974 Employment	1985 Employment	Percent Change 1974-1985	AVERAGE ANNUAL WORKER NEEDS 1974-1985 Total	Openings Due To Growth	Openings Due To Replacement
Radio, TV Announcers	405	436	7.7	7	3	4
Writers, Artists, Entertain, nec	1,565	2,699	72.5	162	103	59
Other Professional, Technical	52,096	65,428	25.6	3,162	1,212	1,950
Accountants	16,299	18,215	11.8	780	174	606
Architects	1,872	2,825	50.9	139	87	52
Archivists and Curators	120	172	43.3	11	5	6
Clergy	2,859	4,022	40.7	213	106	107
Religious, exc Clergy	712	1,106	55.3	86	36	50
Farm Management Advisors	68	54	-20.6	1	-1	2
Foresters, Conservationists	2,127	2,605	22.5	84	43	41
Home Management Advisors	73	90	23.3	7	2	5
Judges	205	191	- 6.8	12	-1	13
Lawyers	5,315	7,724	45.3	392	219	173
Librarians	3,506	3,558	1.5	213	5	208
Operations, Systems Research	1,596	2,279	42.8	88	62	26
Personnel Labor Relations	5,048	6,236	23.5	278	108	170
Research Workers, nec	2,536	3,670	44.7	171	103	68
Recreation Workers	1,874	2,434	29.9	123	51	72
Social Workers	5,356	6,388	19.3	335	94	241
Vocational, Ed Counselors	2,530	3,859	52.5	232	121	111
Managers, Officials, Proprietors	151,895	185,399	22.1	8,078	3,045	5,033
Buyers, Sales, Loan Managers	26,093	35,378	35.6	1,588	844	744
Bank, Financial Managers	8,517	11,148	30.9	501	239	262
Credit Managers	993	1,379	38.9	69	35	34
Buyers, Shippers, Farm Products	277	383	38.3	22	10	12
Buyers, Wholesale, Retail	2,518	3,712	47.4	210	109	101
Purchasing Agents, Buyers, nec	3,205	4,252	32.7	182	95	87
Sales Manager, Retail Trade	5,754	8,226	43.0	369	225	144
Sales Manager, exc Ret Trade	4,829	6,278	30.0	236	132	104
Administrators, Pub Inspectors	16,125	18,990	17.8	832	260	572
Assess, Control, Loc Pub Admin	673	680	1.0	35	1	34

TABLE 7 (Continued)

Occupation	1974 Employment	1985 Employment	Percent Change 1974-1985	AVERAGE ANNUAL WORKER NEEDS 1974-1985 Total	Openings Due To Growth	Openings Due To Replacement
Construction Inspector, Pub	430	489	13.7	21	5	16
Health Administrators	3,024	4,030	33.3	227	91	136
Inspectors, exc Construct Pub	2,396	2,989	24.7	132	54	78
Officials, Admins, Pub	4,938	5,354	8.4	201	38	163
Postmasters and Mail Super	521	441	-15.4	16	-7	23
School Admin, College	786	1,152	46.6	59	33	26
School Admin, Elem, Secondary	3,357	3,855	14.8	141	45	96
Other Managers, Officials, Props	109,677	131,031	19.5	5,658	1,941	3,717
Funeral Directors	518	619	19.5	27	9	18
Mgrs, Superintendants, Bldg	2,773	3,519	26.9	283	68	215
Office Managers, nec	6,333	8,618	36.1	463	208	255
Officrs, Pilots, Pursers, Ship	1,258	1,340	6.5	41	7	34
Officials of Lodges, Unions	3,093	4,035	30.5	219	86	133
Railroad Conductors	595	630	5.9	23	3	20
Restaurant, Cafe, Bar Mgrs	8,267	9,786	18.4	455	138	317
Other Mgrs, Administrators	86,840	102,484	18.0	4,148	1,422	2,726
Sales Workers	86,229	103,315	19.8	5,429	1,553	3,876
Advertising Agents, Sales Wrks	1,143	1,511	32.1	74	33	41
Auctioneers	91	93	2.2	4	0	4
Demonstrators	1,252	1,523	21.6	106	25	81
Hucksters and Peddlers	5,307	6,009	13.2	369	64	305
Insurance Agents, Brokers, Etc	6,924	7,553	9.1	240	57	183
Newspaper Carrier and Vendor	1,516	1,225	-19.2	1	-26	27
Real Estate Agents, Brokers	9,118	9,713	6.5	457	54	403
Stock and Bond Sales Agents	1,232	1,343	9.0	46	10	36
Sales and Sales Workers, nec	59,646	74,345	24.6	4,131	1,336	2,795
Clerical Workers	228,164	289,874	27.0	19,655	5,610	14,045
Stenographers, Typists, Secre	59,791	81,301	36.0	6,657	1,955	4,702
Secretaries, Legal	2,282	3,790	66.1	338	137	201
Secretaries, Medical	1,486	2,165	45.7	179	62	117

TABLE 7 (Continued)

Occupation	1974 Employment	1985 Employment	Percent Change 1974-1985	AVERAGE ANNUAL WORKER NEEDS 1974-1985 Total	Openings Due To Growth	Openings Due To Replacement
Secretaries, Other	41,255	58,229	41.1	4,806	1,543	3,263
Stenographers	1,960	1,372	-30.0	54	-53	107
Typists	12,808	15,745	22.9	1,282	267	1,015
Office Machine Operators	9,125	9,203	0.9	460	7	453
Bookkeeping, Billing Operators	939	965	2.8	63	2	61
Calculating Machine Operators	407	418	2.7	24	1	23
Computer, Peripheral Equip	3,299	4,036	22.3	163	67	96
Duplicating Machine Operators	452	512	13.3	33	5	28
Keypunch	3,122	2,232	-28.5	106	-81	187
Tabulating Machine Operators	35	31	-11.4	2	0	2
Other Office Machine Operators	871	1,009	15.8	70	13	57
Other Clerical Workers	159,248	199,370	25.2	12,537	3,647	8,890
Bank Tellers	5,771	7,342	27.2	548	143	405
Billing Clerks	1,738	2,694	55.0	207	87	120
Bookkeepers	28,945	32,753	13.2	1,976	346	1,630
Cashiers	17,201	20,579	19.6	1,294	307	987
Clerical Assist, Soc Welfare	246	320	30.1	24	7	17
Clerical Supervisors, nec	3,519	4,585	30.3	229	97	132
Collectors, Bill and Account	1,000	1,257	25.7	64	23	41
Counter Clerks, exc Food	5,305	6,853	29.2	472	141	331
Dispatcher, Starter, Vehicle	1,631	2,111	29.4	103	44	59
Enumerators and Interviewers	1,498	1,550	3.5	72	5	67
Estimators, Investigators, nec	6,962	8,545	22.7	449	144	305
Expeditors, Prod Controllers	3,542	3,951	11.5	125	37	88
File Clerks	3,292	3,460	5.1	259	15	244
Insurance Adjust, Examiners	2,122	2,459	15.9	100	31	69
Library Attendants, Assistant	2,848	3,131	9.9	237	26	211
Mail Carriers, Post Office	4,014	4,159	3.6	98	13	85
Mail Handler, exc Post Office	1,928	2,420	25.5	156	45	111
Messengers and Office Helpers	1,058	1,045	- 1.2	48	-1	49
Meter Readers, Utilities	506	525	3.8	10	2	8
Payroll, Time Keeping Clerks	1,833	2,262	23.4	149	39	110
Postal Clerks	4,251	4,508	6.0	183	23	160

TABLE 7 (Continued)

Occupation	1974 Employment	1985 Employment	Percent Change 1974-1985	AVERAGE ANNUAL WORKER NEEDS 1974-1985 Total	Openings Due To Growth	Openings Due To Replacement
Proofreaders	323	452	39.9	35	12	23
Real Estate Appraisers	764	965	26.3	45	18	27
Receptionists	10,259	13,663	33.2	1,155	309	846
Shipping, Receiving Clerks	4,915	6,244	27.0	252	121	131
Statistical Clerks	4,443	4,614	3.8	262	16	246
Stock Clerks, Store Keepers	6,761	7,593	12.3	304	76	228
Teachers Aides, exc Monitors	3,071	4,902	59.6	339	166	173
Telegraph Messengers	22	13	-40.9	-1	-1	0
Telegraph Operators	358	231	-35.5	1	-12	13
Telephone Operators	5,037	4,610	- 8.5	311	-39	350
Ticket Station, Express Agents	1,963	1,841	- 6.2	65	-11	76
Weighers	383	369	- 3.7	5	-1	6
Misc Clerical Workers, nec	21,739	37,364	71.9	2,963	1,420	1,543
Crafts and Kindred Workers	187,400	224,736	19.9	7,6[illegible]	3,394	4,239
Construction Crafts Workers	55,809	70,564	26.4	2,666	1,341	1,325
Carpenters and Apprentices	17,738	22,170	25.0	885	403	482
Brick and Stonemasons and Appr	1,253	1,512	20.7	47	24	23
Bulldozer Operators	2,470	3,783	53.2	174	119	55
Cement and Concrete Finishers	1,155	1,502	30.0	57	32	25
Electricians and Apprentices	11,205	13,726	22.5	452	229	223
Excavating, Grading, Mach Opr	5,611	8,084	44.1	349	225	124
Floor Layers, exc Tile Setters	460	467	1.5	7	1	6
Painters and Apprentices	6,255	6,743	7.8	225	44	181
Paperhangers	70	72	2.9	2	0	2
Plasterers and Apprentices	257	229	-10.9	3	-3	6
Plumbers, Pipefitters and Appr	6,288	8,459	34.5	349	197	152
Roofer and Slaters	1,319	1,757	33.2	55	40	15
Structural Metal Craft Workers	1,232	1,525	23.8	52	27	25
Tilesetters	496	535	7.9	10	4	6
Blue Collar Worker Supvr, nec	21,068	26,405	25.3	990	485	505

TABLE 7 (Continued)

Occupation	1974 Employment	1985 Employment	Percent Change 1974-1985	AVERAGE ANNUAL WORKER NEEDS 1974-1985 Total	Openings Due To Growth	Openings Due To Replacement
Metalworking Craft Wrkrs exc Mec	18,508	21,709	17.3	713	291	422
Blacksmiths	214	145	-32.2	0	-6	6
Boilermakers	958	1,197	24.9	56	22	34
Heat Treaters, Annealers, Etc	142	138	- 2.8	2	-1	3
Forge and Hammer Operators	92	111	20.7	5	2	3
Job and Die Setters, Metal	190	225	18.4	7	3	4
Machinists and Apprentices	8,264	9,510	15.1	295	113	182
Millwrights	2,244	2,913	29.8	127	61	66
Molders, Metal and Apprentices	539	639	18.6	20	9	11
Pattern and Model Makers	803	813	1.2	17	1	16
Rollers and Finishers, Metal	54	48	-11.1	0	-1	1
Sheetmetal Workers and Appr	3,403	3,791	11.4	94	35	59
Tool and Diemakers and Appr	1,605	2,179	35.8	90	52	38
Mechanics, Repairers, Installers	50,602	61,091	20.7	1,903	954	949
Air Cond, Heating, Refrig Mech	2,294	3,058	33.3	131	69	62
Aircraft Mechanics	8,136	9,315	14.5	215	107	108
Auto Accessories Installers	88	82	- 6.8	0	-1	1
Auto Body Repairers	3,164	3,056	- 3.4	24	-10	34
Auto Mechanics and Appr	13,833	16,729	20.9	508	263	245
Data Processing Mach Repairers	924	1,549	67.6	67	57	10
Farm Implement Mechanics	1,060	1,449	36.7	59	35	24
Heavy Equip Mech, Incl Deisel	10,373	12,905	24.4	468	230	238
Household Appliance Mechanics	1,898	2,392	26.0	85	45	40
Loom Fixers	35	50	42.9	2	1	1
Office Machine Repairers	1,287	1,926	49.7	81	58	23
Radio, Television Repairers	2,249	2,992	33.0	115	68	47
Railroad, Car Shop Repairers	822	670	-18.5	5	-14	19
Other Mechanics and Appr	4,439	4,918	10.8	140	44	96
Printing Trade Crafts Workers	4,491	4,634	3.2	147	13	134
Bookbinders	315	327	3.8	19	1	18
Compositors and Typesetters	2,001	1,806	- 9.7	47	-18	65
Electrotypers, Stereotypers	83	61	-26.5	0	-2	2
Engravers Exc Photoengravers	115	106	- 7.8	6	-1	7

TABLE 7 (Continued)

Occupation	1974 Employment	1985 Employment	Percent Change 1974-1985	AVERAGE ANNUAL WORKER NEEDS 1974-1985 Total	Openings Due To Growth	Openings Due To Replacement
Photoengravers, Lithographers	276	335	21.4	13	5	8
Printn Press Opers & Appren	1,701	1,999	17.5	61	27	34
Transportation, Pub Util Craft	10,525	11,514	9.4	237	90	147
Elec Pwr Line Installer, Reprs	2,043	2,540	24.3	79	45	34
Locomotive Engineers	942	1,023	8.6	34	7	27
Locomotive Engineer Helpers	203	103	-49.3	-6	-9	3
Power Station Operators	903	847	- 6.2	13	-5	18
Telephone Installers, Repairers	5,328	5,958	11.8	115	57	58
Telephone Line Instalr, Splicer	1,106	1,043	- 5.7	1	-6	7
Other Crafts, Kindred Workers	26,397	28,819	9.2	977	220	757
Bakers	1,720	1,558	- 9.4	32	-15	47
Cabinetmakers	1,634	1,693	3.6	49	5	44
Carpet Installers	1,135	1,483	30.7	46	32	14
Crane, Derrick, and Hoist Opr	4,693	5,577	18.8	168	80	88
Decorators, Window Dressers	1,177	1,531	30.1	99	32	67
Dental Laboratory Tech	788	904	14.7	38	11	27
Furniture and Wood Finishers	218	207	- 5.0	6	-1	7
Furriers	18	12	-33.3	0	-1	1
Glaziers	921	1,165	26.5	37	22	15
Inspectors, Log and Lumber	1,420	1,503	5.8	45	8	37
Inspectors, Other	2,069	2,193	6.0	74	11	63
Jewelers and Watchmakers	655	635	- 3.1	26	-2	28
Millers, Grain, Flour, Feed	74	68	- 8.1	1	-1	2
Motion Picture Projectionists	311	370	19.0	14	5	9
Opticians, Lens Grindr, Polishr	626	1,024	63.6	55	36	19
Piano, Organ Tuners, Repairers	163	159	- 2.4	8	0	8
Shipfitters	1,094	1,164	6.4	31	6	25
Shoe Repairers	405	287	-29.1	12	-11	23
Sign Painters and Letterers	400	422	5.5	18	2	16
Stationary Engineers	2,882	2,616	- 9.2	53	-24	77
Stone Cutters, Stone Carvers	21	15	- 2.9	-1	-1	0
Tailors	573	765	13.7	56	8	48
Upholsterers	1,140	1,260	10.5	58	11	47
Crafts, Kindred Workers, nec	2,160	2,208	2.2	50	4	46

TABLE 7 (Continued)

Occupation	1974 Employment	1985 Employment	Percent Change 1974-1985	AVERAGE ANNUAL WORKER NEEDS 1974-1985 Total	Openings Due To Growth	Openings Due To Replacement
Operatives	169,182	189,000	11.7	6,189	1,801	4,388
Operatives, exc Transport	118,909	134,042	12.7	4,908	1,376	3,532
Semiskilled Metalworking	13,904	17,503	25.9	632	327	305
Drill Press Operatives	314	309	- 1.6	7	-1	8
Furnace Tendrs, Smeltrs, Pourers	1,342	1,548	15.4	39	19	20
Grinding Machine Operatives	856	832	- 2.8	18	-2	20
Heaters, Metal	18	16	-11.1	0	0	0
Lathe, Milling Mach Operatives	1,137	1,152	1.3	24	1	23
Metal Platers	200	257	28.5	8	5	3
Other Precision Mach Operators	606	678	11.9	21	7	14
Punch Stamping Press Operative	480	532	10.8	14	5	9
Solderers	110	71	-35.5	-1	-4	3
Welders and Flame Cutters	8,841	12,108	37.0	501	297	204
Semiskilled Textile	270	279	3.3	14	1	13
Carding, Lapping, Combing Oprs	14	10	-28.6	0	0	0
Knitters, Loopers, and Toppers	19	31	63.2	3	1	2
Spinners, Twisters, Winders	49	52	6.1	3	0	3
Weavers	53	45	-15.1	2	-1	3
Other Textile Operatives	135	141	4.4	7	1	6
Semiskilled Packng, Inspectng	15,489	19,004	22.7	954	319	635
Checkers, Examiners, Etc, Mfg	4,367	5,962	36.5	270	145	125
Graders and Sorters, Mfg	1,186	1,539	29.8	89	32	57
Meat Wrappers, Retail Trade	1,272	1,461	14.9	75	17	58
Packer, Wrapper, Ex Meat, Produce	6,831	8,009	17.2	394	107	287
Prod Grdr, Packer, exc Fact, Farm	1,833	2,033	10.9	127	18	109
Other Operatives, exc Transport	89,246	97,256	9.0	3,307	728	2,579
Asbestos, Insulation Workers	641	996	55.4	43	32	11
Assemblers	6,656	8,284	24.5	336	148	188
Blasters	102	81	-20.6	1	-2	3
Bottling, Canning Operatives	1,451	1,461	0.7	45	1	44
Surveyor Helpers	307	358	16.6	8	5	3
Clothing Ironers and Pressers	1,552	1,361	-12.3	64	-17	81

TABLE 7 (Continued)

Occupation	1974 Employment	1985 Employment	Percent Change 1974-1985	AVERAGE ANNUAL WORKER NEEDS 1974-1985 Total	Openings Due To Growth	Openings Due To Replacement
Cutting Operatives, nec	2,706	2,950	9.0	104	22	82
Dressmakers, exc Factory	1,710	1,661	-2.9	112	-4	116
Drillers, Earth	638	663	3.9	16	2	14
Dry Wall Installers, Lathes	2,087	2,388	14.4	45	27	18
Dyers	53	58	9.4	1	0	1
Filer, Polisher, Sander, Buffer	1,099	967	-12.0	14	-12	26
Garage Wrkrs; Gas Station Atten	7,966	8,786	10.3	155	75	80
Laundry, Dry Cleaning Oprs, nec	2,846	3,669	28.9	240	75	165
Meat Cutters, Butchers, exc Mfg	3,297	3,323	0.8	81	2	79
Meat Cutters, Butchers	1,053	1,133	7.6	33	7	26
Milleners	32	30	- 6.2	3	0	3
Mine Operatives, nec	543	528	- 2.8	12	-1	13
Mixing Operatives	735	806	9.7	23	6	17
Oilers, Greasers, exc Auto	1,136	1,050	- 7.6	19	-8	27
Painters, Mfg Articles	1,850	1,878	1.5	36	3	33
Photographic Process Workers	1,094	1,389	27.0	87	27	60
Riveters and Fasteners	1,166	1,115	- 4.4	9	-5	14
Sailors and Deckhands	1,146	1,231	7.4	32	8	24
Sawyers	4,573	5,028	9.9	140	41	99
Sewers and Stitchers	4,398	5,373	22.2	384	87	297
Shoemaking Machine Operatives	12	13	8.3	1	0	1
Furnace Tendr, Stokr exc Metal	1,491	1,316	-11.7	20	-16	36
Winding Operatives, nec	472	434	- 8.1	4	-3	7
Misc Mach Operatives	19,062	20,240	6.2	579	107	472
Operatives, nec	17,372	18,686	7.6	657	119	538
Transport Equipment Operatives	50,273	54,958	9.3	1,282	426	856
Boat Operators	219	178	-18.7	2	-4	6
Bus Drivers	5,017	5,023	0.1	138	1	137
Conductors and Opr. Urban Rail	12	13	8.3	0	0	0
Delivery and Route Workers	11,332	13,629	20.3	391	209	182
Fork Lift, Tow Motor Operatives	6,365	7,400	16.3	189	94	95
Rail Vehicle Operators, nec	76	66	-13.2	1	-1	2
Parking Attendants	622	597	- 4.0	25	-2	27
Railroad Brake Operators	1,045	1,233	18.0	38	17	21
Railroad Switch Operators	1,012	802	-20.8	-7	-19	12

TABLE 7 (Continued)

Occupation	1974 Employment	1985 Employment	Percent Change 1974-1985	AVERAGE ANNUAL WORKER NEEDS 1974-1985 Total	Openings Due To Growth	Openings Due To Replacement
Taxicab Drivers, Chauffeurs	1,364	1,347	- 1.2	32	-2	34
Truck Drivers	23,209	24,670	6.3	473	133	340
Service Workers	184,070	228,934	24.4	15,268	4,079	11,189
Cleaning Service Workers	30,934	39,011	26.1	2,399	734	1,665
Lodging Quartrs Cleanrs exc Pr	3,014	4,054	34.5	325	95	230
Bldg Interior Cleaners, nec	8,234	11,887	44.4	830	332	498
Janitors and Sextons	19,686	23,070	17.2	1,245	308	937
Food Service Workers	69,411	92,331	33.0	6,234	2,084	4,150
Bartenders	6,550	9,405	43.6	541	260	281
Waiters' Assistants	3,250	3,816	17.4	112	51	61
Cooks, exc Private	18,701	26,961	44.2	1,807	751	1,056
Dishwashers	4,921	6,029	22.5	258	101	157
Food Counter, Fountain Workers	4,308	5,201	20.7	372	81	291
Waiters	24,634	32,908	33.6	2,646	752	1,894
Food Workers, nec, exc Private	7,047	8,011	13.7	497	88	409
Health Service Workers	26,700	39,409	47.6	3,282	1,155	2,127
Dental Assistants	3,266	5,380	64.7	525	192	333
Health Aides, Except Nursing	2,486	3,552	42.9	268	97	171
Health Trainees	203	44	-78.3	-2	-14	12
Lay Midwives	38	24	-36.8	1	-1	2
Nurses Aides, Orderlies	12,392	17,499	41.2	1,396	464	932
Practical Nurses	8,315	12,910	55.3	1,096	418	678
Personal Service Workers	26,328	34,171	29.8	2,662	713	1,949
Flight Attendants	1,568	2,000	27.6	197	39	158
Attend, Recreation, Amusement	1,694	1,980	16.9	78	26	52
Atten, Personal Service, nec	1,009	1,138	12.8	85	12	73
Baggage Porters and Bellhops	269	226	-16.0	-1	-4	3
Barbers	2,803	2,364	-15.7	74	-40	114
Boarding, Lodging Housekeepers	618	837	35.4	70	20	50
Bootblacks	39	10	-74.4	-1	-3	2
Child Care Workers, exc Private	5,963	9,298	55.9	837	303	534

TABLE 7 (Continued)

Occupation	1974 Employment	1985 Employment	Percent Change 1974-1985	AVERAGE ANNUAL WORKER NEEDS 1974-1985 Total	Openings Due To Growth	Openings Due To Replacement
Elevator Operators	254	189	-25.6	7	-6	13
Hairdressers, Cosmetologists	8,573	11,873	38.5	1,048	300	748
Housekeepers, exc Private	1,762	1,848	4.9	110	8	102
School Monitors	680	943	38.7	56	24	32
Ushers, Recreation, Amusement	249	239	- 4.0	14	-1	15
Welfare Service Aides	847	1,226	44.7	88	34	54
Protective and Service Workers	16,347	16,962	3.8	460	56	404
Crossing Guard, Bridgetenders	272	259	- 4.8	15	-1	16
Firefighters	4,110	3,971	- 3.4	32	-13	45
Guards	5,457	5,339	- 2.2	240	-11	251
Marshals and Constables	85	123	44.7	4	3	1
Police and Detectives	5,637	6,436	14.2	138	73	65
Sheriffs and Bailiffs	786	834	6.1	29	4	25
Private Household Workers	14,350	7,050	-50.9	231	-664	895
Child Care Workers	10,503	4,995	-52.4	137	-501	638
Cooks, Private	168	88	-47.6	4	-7	11
Housekeepers, Private	1,053	562	-46.6	29	-45	74
Launderers, Private Household	65	17	-73.8	-1	-4	3
Pri Household Cleaners, Servants	2,561	1,388	-45.8	62	-107	169
Laborers, Except Farm	80,770	85,396	5.7	2,138	421	1,717
Animal Caretakers, exc Farm	2,178	3,582	64.5	246	128	118
Carpenters, Helpers	1,270	1,625	28.0	47	32	15
Constr Labr, exc Carpenter Help	10,209	11,789	15.5	315	144	171
Fishers, Hunters and Trappers	1,623	1,237	-23.8	13	-35	48
Freight, Material Handlers	12,513	12,431	- 0.7	206	-7	213
Garbage Collectors	638	805	26.2	26	15	11
Gardenrs, Groundkeepr, exc Farm	10,006	10,706	7.0	459	64	395
Longshore Workers, Stevedores	2,906	2,971	2.2	62	6	56
Timbercutting, Logging Workers	7,798	7,240	- 7.2	73	-51	124
Stock Handlers	11,339	13,868	22.3	415	229	186
Teamsters	266	137	-48.5	-9	-12	3
Vehicle Washers, Equip Cleaners	2,663	2,743	3.0	50	7	43

TABLE 7 (Continued)

Occupation	1974 Employment	1985 Employment	Percent Change 1974-1985	AVERAGE ANNUAL WORKER NEEDS 1974-1985 Total	Openings Due To Growth	Openings Due To Replacement
Warehouse Laborers, nec	5,963	5,770	- 3.2	73	-18	91
Other Laborers	11,398	10,492	- 7.9	162	-82	244
Farmers and Farm Workers	50,698	51,897	2.4	2,134	109	2,025
Farmers and Farm Managers	24,428	25,595	4.8	1,258	106	1,152
Farmers (Owners and Tenants)	23,770	24,271	2.1	1,168	46	1,122
Farm Managers	658	1,324	101.2	91	61	30
Farm Laborers, Farm Supervisors	26,270	26,302	0.1	876	3	873
Farm Labor Supervisors	799	1,073	34.3	53	25	28
Farm Laborers, Wage Wrkrs	20,080	18,438	- 8.2	452	-149	601
Farm Laborers, Unpaid Family	5,336	6,678	25.1	361	122	239
Farm Laborers, Self-Empl	55	113	105.5	10	5	5

ABBREVIATIONS

Appr: Apprentices
Exc: Except
Incl: Including
Nec: Not elsewhere classified
Pr: Private
Pub: Public
Opr: Operator
Tech: Technician

NOTE: AVERAGE ANNUAL WORKER NEEDS DETAIL MAY NOT ADD TO TOTAL DUE TO ROUNDING.

*Occupations with employment of ten or less.

GLOSSARY

Crosswalk — The Crosswalk is a correspondence index relating the classification system of the Industry-Occupation Matrix (which depicts the occupational mix of the labor force) to the coding system of the Office of Education. The employment level presented for each educational program is dictated by the Crosswalk assignments. The Crosswalk was designed to trace employment opportunities as well as to match skills. For example, we know that graduates of the stenographer program are likely to enter the labor market as typists and secretaries. The Crosswalk attempts to deal with this fact. The *Technical Report*, provided as a separate volume, lists the Crosswalk index used for the third edition and describes the methods employed in its design.

Demand — Demand represents available job opportunities classified by skills related to specific educational programs. Total job openings, not just entry-level positions, are included. However, educational programs supply only a portion of this total demand. Thus, the demand level presented in the forecast constitutes a high bound of positions available to program graduates. The mix of skills applicable to a given program is controlled by the Crosswalk. Demand is calculated as the sum of expansion and replacement.

The Economic Forecast — The Economic Forecast projects the size of the labor force for several future years. Through the Economic Forecast, assumptions concerning the national and state economic outlook enter the Job Opportunities Forecast. The Economic Forecast is broken into about 30 industry sectors. Using these levels of industry employment, the JOF model then determines the corresponding levels of occupational employment. Data for the Economic Forecast are taken from the *Long Term Employment Forecast*, developed by the Washington State Department of Revenue for the calendar years 1977-85. Actual labor force reports are used for the calendar years 1973-76. The Economic Forecast and historic labor reports are adapted for use in the JOF. The adaptation includes conversion from calendar to fiscal years. The methods of adaptation are discussed at the end of Appendix B in the *Technical Report*.

Educational Programs — Educational Programs, or rather the employment skills assocaited with them, form the basis of occupational classification within this forecast. For convenience, programs and occupations sometimes become synonymous. However, when the term program is used in this way, it is program skills that are implied. Programs do not employ people, but rather contribute workers with specific

occupational skills to a supply pool. The job opportunities reported in this forecast are filled from this supply pool, of which educational programs are one source.

Employment

Employment is a count of jobs in the labor force classified by skills related to specific educational programs. Employment, unlike demand, includes all job positions. Demand includes only job positions available to be filled. Employment is allocated from the jobs reflected by the Economic Forecast to each educational program according to the instructions in the Crosswalk. Graduates of educational programs may find employment in a range of related occupations. This feature is captured in the forecast through the design of the Crosswalk. For example, the employment levels given for the stenographer program include not only stenographer positions, but secretarial and typist positions as well. All jobs are counted, including those of full-time, part-time, and dual job holders. The employment count combines jobs held by all types of workers, including the self-employed, government workers, and unpaid family workers.

Expansion

Expansion represents job opportunities created by economic growth. Expansion is computed for an educational program as the difference between the employment forecast in a given year and the forecast for the previous year. As such, a negative value for expansion represents a decline in the employment level.

Fiscal Years

Fiscal Years 1974 through 1985 form the twelve time divisions of the forecast. A fiscal year (FY) runs from July 1st through the following June 31st. For example, FY 1978 began on July 1, 1977. The first three years of the forecast have now passed. However, no basis exists to measure occupational employment directly for FY 1974-77. The same modeling procedures used for estimating occupational employment for future years were therefore applied to this historic period. One difference exists in the results presented. Those for the historic period (FY 1974-77) are based upon actual labor reports (of employment by industry). Those for the future period (FY 1978-85) are based on the Economic Forecast.

Industry-Occupation Matrix

The Industry-Occupation Matrix determines the mix of occupational employment in the labor force. This detailed data base, prepared by the Bureau of Labor Statistics, is available for two base years, 1970 and 1974, and a target year, 1985. The model uses this data base to account for shifts in the occupational staffing patterns of the labor force. The Crosswalk converts the classification system of this matrix to the classification system for educational programs.

Job Opportunities — See *Demand* above.

Jobs — See *Employment* above.

OE-Codes — OE-Codes reflect the classification system of the U. S. Office of Education for educational programs in the nation. The codes used in the Job Opportunities Forecast have been adapted for Washington State and therefore differ slightly from the national codes in some cases. (See Part IV, Section 5 for references to codes not included in the forecast.) The professional occupations given in Part IV, Section 3, use the codes of the Higher Education General Information Survey (HEGIS), preceded by a "99".

Replacement — Replacement represents job opportunities created by persons leaving the labor force for reasons such as quitting, being fired, retirement, out-migration, etc. Job openings created when workers change occupations while remaining in the labor force are not included. Replacement for a specific program is computed by multiplying a replacement rate and a level of employment.

Replacement Rates — Replacement Rates are proportions of jobs (employment count) in a given occupation that become available each year because other workers have separated from the labor force. The rates presented in the forecast for each educational program have been computed from data provided by the Bureau of Labor Statistics for the occupational categories of the Industry Occupation Matrix. The computation is based on an employment weighted averaging procedure for the years 1974 and 1980. Values are interpolated for the intervening years. Lacking any basis to project replacement rates after 1980, values for 1980 through 1985 remain constant. The replacement rates used for the third edition have been recently revised to reflect the changing participation of women in the labor force. As a consequence, the rates are somewhat lower than those reported in the second edition. This change in replacement rates varies by occupation, the most profound shifts coming in occupations traditionally dominated by women. Since replacement typically represents from 50 to 75 percent of total job opportunities, the rate revisions have a major impact on projected demand.

Supply — Supply represents workers, living in the local labor market area, who are qualified to work in a given occupational field. In addition to workers currently employed, supply has other components. These components include graduates from public and private educational programs, and graduates of employer training, apprenticeship, and military training programs. In addition there is a pool of workers who possess skills in several fields and who would shift occupations given the opportunity. Also, unemployed workers must be considered.

Finally, the most difficult to estimate, are workers who migrate into or out of the local labor market. Because of the lack of appropriate data, supply is not part of the Job Opportunities Forecast.

Vocational and Professional

Vocational and Professional programs are represented in the Job Opportunities Forecast. In the past, the JOF has been exclusively concerned with vocational education programs. The third edition now includes a short section of professional education programs. There is sometimes an overlap in jobs applicable to vocational and professional education skills. The first attempt to capture professional job opportunities in this forecast, avoids this problem by considering only those occupations not previously assigned to vocational education. As such, the professional programs presented in Section 3 of the forecast represent only a portion of all professional education programs, currently (or potentially) offered in the state.

ACRONYMS

BLS	U. S. Bureau of Labor Statistics (DOL)
CDC	Control Data Corporation
DVE	Commission for Vocational Education
DOL	U. S. Department of Labor
DOT	Dictionary of Occupational Titles
ES	Employment Security Department
FY	Fiscal Year
HRPI	Human Resources Planning Institute, Inc.
HEGIS	Higher Education General Information Survey
JOF	Job Opportunities Forecast
NOICC	National Occupational Information Coordinating Committee
OFM	Office of Financial Management
OE	U. S. Office of Education (HEW)
OES	Occupational Employment Statistics
SOICC	State Occupational Information Coordinating Committee

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